

Yorkshire Philosophical Society.

ANNUAL REPORT

FOR

MDCCCXCVI.



ANNUAL REPORT
OF THE COUNCIL
OF THE
YORKSHIRE
PHILOSOPHICAL SOCIETY

FOR

MDCCCXCVI.

PRESENTED TO THE ANNUAL MEETING,

FEBRUARY 1st, 1897.



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1897.

TRUSTEES
OF
THE YORKSHIRE MUSEUM.
APPOINTED BY ROYAL GRANT.

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WILLIAM LAWTON.

T. S. NOBLE.

WILLIAM WALKER.

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MINERALOGY	- - - - -	W. H. HUDLESTON, M.A., F.R.S.
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COMPARATIVE ANATOMY	- -	T. ANDERSON, M.D., B.Sc.
ORNITHOLOGY	- - - - -	J. BACKHOUSE, F.Z.S., M.B.O.U.
BOTANY	- - - - -	H. J. WILKINSON.
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KEEPER OF THE MUSEUM.

HENRY MAURICE PLATNAUER, A.R.S.M., B.Sc.

REPORT OF THE COUNCIL
OF THE
YORKSHIRE PHILOSOPHICAL SOCIETY,
FEBRUARY 1ST, 1897.

This Report will, as in previous years, deal with the financial and general condition and prospects of the Society, and will then embody the reports of the Curators of the various departments connected with the Museum.

The income of the Society for the past year has been £1,171 5s. 2d., and the outgoings £1,257 3s. 1d., leaving an excess of expenditure over income of £85 17s. 11d. As, however, the balance in the hands of the Treasurer at the end of 1895 was £157 8s. 7d., there is still the sum of £71 10s. 8d. in hand. The Council does not by any means recommend that expenditure should exceed income, but considers it not unadvisable that improvements of a substantial and permanent nature should be made in times of comparative prosperity, and it is to improvements of this nature that a large part of the extra expenditure this year is due. It is also to be noted that the transfer of the Abbey Walls to the Corporation, which has now been completed, has involved the surrender of the rent of the Bootham and Marygate Towers on the part of the Society, and our receipts have thus suffered a corresponding diminution.

In consequence of an alteration of rule made by a Special General Meeting, held October 5th, the time of the Monthly General Meetings has been altered to 5 p.m. of the same day on which the Council meetings are held, and efforts have been made to secure the reading of a Paper on some subject of scientific interest at each meeting. So far, the experiment has been completely successful; the meetings since the introduction of the new rule have been very animated and remarkably well attended.

The Society has suffered considerable loss by death during the past year. First and foremost comes the death of Chancellor Raine. A short memoir of our late Curator of Archæology will be found further on in the Report, so we will not here dwell on this serious loss. Thirteen other members have been lost by death, and 32 by resignation. It is gratifying, however, to note that the Society nearly maintains its numerical strength in spite of losses by death and resignation.

Mr. Noble's long career of service as Honorary Secretary of the Society terminated this year by his resignation. No adequate recognition for 38 years of unremitting care and interest could be offered; but the Council hopes that Mr. Noble will undertake the office of Vice-President, and accept the slight expression of grateful appreciation presented him at the Annual General Meeting as an earnest that his services in the past are appreciated by his colleagues.

The following Lectures have been given in the Museum during the year:—

Thursday, January 30th.—“ Mezzotinting and Mezzotinters ”
(illustrated by Lantern Pictures). By A. Buckle, B.A.

Thursday, February 13th.—“ William the Conqueror's
Country ” (with Lantern Illustrations). By the Rev.
T. Gough., B.Sc.

Thursday, February 27th.—“ A Greek Lady (illustrated
by Lantern Pictures). By the Rev. Chancellor Raine,
D.C.L., &c.

Thursday, March 12th.—“ Brain Rest.” By Sir James
Creighton Browne, M.A., LL.D., F.R.S.

Thursday, March 19th.—“ French By-ways ” (illustrated by
Lantern Pictures). By Tempest Anderson, M.D., B.Sc.

Thursday, March 26th.—“ Two Famous Mariners of York.”
By J. S. Rowntree.

Thursday, April 16th.—The Members of the Photographic
Section gave a Lantern Night.

Thursday, October 29th.—“ Homer's Iliad.” By the Rev.
Canon Fausset, M.A.

Thursday, November 12th.—“ Colour Photography ” (with
Lantern Illustrations). By Baron Alphonse Berget.

Thursday, November 26th.—“The Dolomites” (illustrated by Lantern Pictures taken by the Lecturer). By Paul Lange, Ex-President of the Liverpool Amateur Photographic Association.

Thursday, December 10th.—“John Sebastian Bach.” By Miss M. M. Paget, A.R.C.M., L.R.A.M. (with Musical Illustrations by Miss C. A. Bigge, A.R.C.M., Miss Knocker, and Mrs. Burrell).

Thursday, December 22nd.—“The Volcanic Eruption of Ambrym Island.” By Commander Purey-Cust, R.N.

Several of these have been of unusual interest, and the Council desire publicly to thank those who have so kindly and generously assisted them, since owing to the unfortunate state of the finances of the Society it has been impossible to offer them any honorarium beyond expenses out of pocket. They would particularly thank Baron Alphonse Berget, who came specially from Paris; and Sir Creighton Browne and Miss Paget, who came from London; and Paul Lange, who came from Liverpool.

The attendance at the lectures has been, as a rule, very good, and has several times taxed the accommodation of the Theatre to the utmost. Financial considerations prevent, at present, the consideration of extensive schemes of improvement on which the Council would willingly embark; but they hope that certain small alterations in the doors and gangways will be found to have materially reduced the discomforts hitherto justly complained of.

It cannot be too constantly borne in mind that there is still a funded debt of about £3,000 owing by the Society, the sinking fund for the ultimate extinction of which involves an annual payment of nearly £200, which, with the unavoidable establishment charges incident on such extensive premises, seriously cripples the work of the Society.

The Council recommend Mr. T. S. Noble as a Vice-President in place of Chancellor Raine, deceased; the following as new members of Council in place of those who retire by rotation:—The Right Hon. the Lord Mayor (Mr. Alderman Milward), The Sheriff (Mr. Alderman Dodsworth), James Backhouse, F.Z.S., and George Wilson; and as honorary members, Baron Alphonse Berget, Sir Clements Markham, and Professor Sylvanus Thompson, F.R.S.

ANTIQUITIES.—The death of the famous Curator has proved, as was expected, an irreparable loss to this Department, and has caused a practical standstill in its work. The only acquisition made which deserves notice here is a series of Roman remains, chiefly Pottery, from Filey (Carr Naze) including a remarkably fine Urn of slip-work Pottery, obtained for us by Mr. Boynton, through the kind permission of Mrs. Firman. These fragments, together with the roughly-carved stumps of Pillars now in the Crescent, are the only Roman Antiquities ever found at Filey, and on their discovery rests the conjecture that Filey was the Roman “Prætorium”—an hypothesis which has been fiercely disputed, but about which the last word has perhaps yet to be said.

GEOLOGY.—The most important addition to this Department is a very fine collection of Muschelkalk fossils, presented by our honorary member, Dr. Pfarrer Engel. This very valuable series contains many rare species from a formation which does not occur in Great Britain. The other fossils presented during the year are acknowledged in the list of donations.

COMPARATIVE ANATOMY.—This Department has received no accessions during the past year except an albino mole from Flintshire. The collections are in good order and preservation, but the arrangement leaves much to be desired. The Society possesses ample material for a useful and instructive series illustrative of the Comparative Osteology of the Mammalia, and the Curator looks forward to the time when such a series, fully and descriptively labelled, may be arranged in the galleries of the Museum. A series of this nature is of far more use than any hap-hazard collection, however rich the latter may be in good specimens.

ORNITHOLOGICAL DEPARTMENT REPORT.—Among the more important additions to the Bird Collection during the past year are the following:—A fine female example of the Barred Warbler, which was shot in a garden near to Hull, and was purchased for the Museum. Three Birds shot in Wensleydale have been presented by Lord Bolton, viz., Leach's Petrel,

Great Snipe, and a very old example of the Scaup Duck *Fuligula maila* (female), which latter was at first thought to be a hybrid, from its colouring. The new British Bird Collection has been increased by the addition of some fourteen cases, and several more are in course of preparation. The Egg Collection has been augmented by the presentation of several Icelandic Birds' Eggs by Dr. Tempest Anderson, among which are the Red-necked Phalarope, Golden Plover and Eared Grebe. A Lapwing's Egg (*Vanellus vulgaris*), of remarkably light ground colour, taken in the neighbourhood of this City, was also presented by Mr. M. R. Bullivant.

ENTOMOLOGY.—The various collections in this Department are in good order. During the past year the introductory series of Insects has been completed, and the arrangement of an illustrative series of Neuroptera has been taken in hand. This work has unfortunately been checked by the difficulty of getting good illustrative specimens. As soon as this difficulty has been overcome, the series will be exhibited, and the arrangement of the Hymenoptera on a similar plan will be begun.

BOTANY.—The additions to this Department consist of a splendid series of *Arenaria gothica* Fr., from Ribbleshead, Ingleton, Yorkshire; also specimens of *Polygala austriaca*, Crantz, and *Polygala calcarea*, F. Schultz, from Surrey, presented by Mr. William Whitwell, F.L.S. A specimen of *Cotula coronopifolia* L. was found at Birkenhead by Miss B. Keyworth, and presented by her to the Society. The specimens arranged during the year (1896) will be found enumerated on pp. 13—35.

MINERALOGY.—The Curator of this Department reports that the collections are in good order. During the past year there has been but little change. Since the Mineral Cases are full, almost the only work possible consists in the occasional introduction of better specimens by way of replacement. This has been effected to a slight extent as the result of some purchases made at a sale near Selby. The Keeper of the

Museum, also, brought back with him a few specimens from the Tyrol. A gap in the Rock Collection has been filled up by the presentation of a series of Antrim Rhyolites from Miss Andrews, of Belfast. The Phonolites, Gabbros, and Diabases are, however, still poorly represented.

CONCHOLOGY.—Owing to the long continued illness of the Curator, little work has been done in this Department. The collections have been enriched by specimens of about thirty new species, chiefly land mollusca, from the collection of the late Rev. Richard Brook, of Gateforth.

LIBRARY.—A glance at our lists of donations will show that the Library continues to receive numerous and valuable accessions, apart from books and various publications purchased. Unfortunately, the space required for the accommodation of these additions is rapidly becoming inadequate. Unless fresh cases can be provided, our Library will in a short time become a mere store-room in which systematic arrangement is impossible. The Librarian ventures to express a hope that before long steps may be taken that will enable him to keep pace with the rapid expansion of this department.

METEOROLOGY.—The prominent features of 1896 weather were the mild winter months, with an almost entire absence of snow, the dry and brilliant Spring and early Summer, and the dull and drenching Autumn. To the meteorologist, however, the most noteworthy event was the unprecedented height of the barometer on January 9th, when, for the first time in our records, it rose above 31 inches.

Temperature, as given by the mean of the maxima and minima, was more than a degree above the average, working out to 48·9°. Compared with the records taken at 9 and 9, this is $\frac{1}{2}^{\circ}$ higher, which is the average divergence found in previous years. The table of differences shows a considerable monthly excess in August. There was a recovery in September, but October was more than four degrees below the average, although there was no frost until the 20th, and then nothing to compare with the severe visitation of the previous year. No

October has been so cold since 1842 (43.3°), although that of 1887 was only half a degree warmer. May 12th was remarkably hot; one of our maximum thermometers reached 80° , the other rather less. The day before was absolutely cloudless, an event rarely known here. 80° or above was further reached three times in June and once in July, or five times in all. From March to June clear days were abundant, as tested by the visibility of the West Riding Hills from Feversham Terrace. But the Autumn was most unfavourable in this respect.

Mean Pressure was slightly in excess, and greatly so in January. That the month should have been also exceptionally mild is therefore the more unusual. It may be traced to the position of the high barometer. The centre of the anticyclone was to the North West; usually it forms in winter to the North East, over Scandinavia and Siberia. The unusual conditions are shown in the charts at the end of the Report, re-produced from the Weekly Weather Report of the Meteorological office, and kindly lent by the Natural History Journal. The contrast, indeed, could not be better illustrated than by comparing the winter with that of the previous year. Then, also, the barometer rose above 31 inches, but this was in Scandinavia (January 28th), although so near as Christiana. Thirty-one inches was reached first at Stornoway on the evening of the 8th. Fort William reported 31.098 inches, which is the highest ever known in our islands. In Banffshire 31.007 was recorded in 1778, 31.046 in 1808, and 31.07 was also reported in Scotland in 1820. The highest for York, previously, was 30.99 in March, 1854. As we have previously only had ten records in all as high as 30.80, it is remarkable that 30.86 was again reached on January 29th and 30th, when 30.96 inches was recorded in South Ireland.

The lowest record for York was 27.777 inches in December, 1886, when 27.24 was registered at Omagh, County Tyrone. Thus the extreme range for York now stands at 3.228 inches, and for the British Islands at 3.86. This is a difference in pressure of nearly 2lbs, per square inch, or some 3,000 tons per acre. Yet no one would perceive the change who had not a barometer at his elbow.

Bright Sunshine was very deficient in the Autumn months, August being especially dull. Only August, 1885, has been worse since records were begun in 1881. September, also, was in striking contrast to the brilliant month of 1895. January, April, and November did their duty best, although the last named gave us a shocking spell of sunless gloom from the 21st to the 29th.

Rain or Snow (exceeding 0.005 inches of water) fell on 190 days. This is 20 days more than our average, yet the total rainfall, 21.98 inches, is three inches less. March and December are chiefly responsible for the former; January, April, May and July for the latter. Heavy thunderstorms in June prevented the drought in these districts from assuming the serious aspect of some other parts, notably in the South West. Snow fell on two days in March and four in December. This is almost certainly the lowest record in our period. Last year, at least, a few flakes were noted on 45 days. There were 23 days with thunderstorms, ten of them in June, including a consecutive series from the 2nd to the 8th.

The race for first and last places in the cumulative rain totals from 1841 continues as exciting as ever. For the three wettest months we have as totals, August, 151.18 inches; October, 150.79; and July, 149.85. Thus, with over twelve feet of rainfall apiece, the winner leads by a bare third of an inch. July has dropped back to third place, although only 1.33 behind the first. The three driest months are closer still. Handicapped to a 30 day month the values are;—April, 88.51; March, 88.74 (actually, 91.60); and February, 89.24 (actually, 84.05). April has thus slipped to the rear; but with only $\frac{3}{4}$ inch difference between the first and third it is still any man's race before the end of this decade is gained. The same is nearly as true of the three wettest months. Still a consistent backer of August, from 1841 on, would have come out winner in the main. It led without a break from 1857 to 1886, the rest being nowhere in the latter half of the sixties.

Floods of eight feet and over occurred on March 7th and December 5th and 6th, when **nine** feet three inches was reached. Returns, rather fuller than last year, have been received from the gauges up the river. The results, however, in the absence

of self-registering instruments are not very satisfactory. This year they indicate a lapse of about 18 hours between the up-river records and highest flood at York. Combining the results for the two years, it would seem to require 22 hours for the floods to come down from Pateley Bridge (7 observations), 20 from Middleham (28 observations), and 21 from Richmond (10 observations).

Auroras were noted on twelve nights, against 23 in 1895, and 34 in 1894. The monthly distribution was 4, 0, 2, 2, 2 from January to May, 1 in October, and 1 in November. None were particularly bright, but streamers were noted on March 4th, and May 2nd and 3rd.

Under advice from the Meteorological Office the rain gauges and screen were removed in September, 1895, from the position before the Multangular Tower to the open ground North of St. Mary's Abbey. With the close of the year a second screen was occupied, as a single screen was judged to be too crowded for the double set of instruments. The occasional difference between the maximum thermometers may be thus accounted for, as the one read at 9 A.M. was placed too high up.

We must further report an unfortunate case of wanton mischief. In January of this year, 1897, the lock of the old screen was wrenched off and one of the costly thermometers removed.

We have pleasure in again acknowledging the returns from different gentlemen, entered under their names in our tables.

PHOTOGRAPHIC SECTION. — The Monthly meetings have been regularly held, and much interesting material has been brought forward. Several causes have tended to interfere with large attendances. Thus members, as they have become proficient, have been led to undertake lectures, illustrated by slides of their own making, and have delivered them before the Society at large instead of the smaller audience of the Section; the public also takes more interest in Photography than formerly, and at least one highly technical lecture, which would have more strictly come before the Section, was listened to with intense interest by a large general audience. Photography also, like microscopy, is now such a recognised part of

the procedure of several branches of science that its separate consideration as a special branch of science can scarcely be theoretically justified, however practically convenient. The number of members of the Section continues nearly the same, and its financial position is satisfactory. The names of new members will be received by the Honorary Secretary (H. Dennis Taylor), and they can join on the favourable terms recently adopted by the Council.

THE REV. CHANCELLOR RAINE.

It is with the deepest regret that we record the great loss which the Society has sustained by the death of our late Curator of Antiquities, who, by years of indefatigable labour, had so greatly contributed to get together and arrange the invaluable collection of local antiquities which are among our choicest treasures.

The Rev. James Raine was a native of Durham, and son of the late James Raine of that city, the eminent archæologist. He was educated at the Cathedral Grammar School, and graduated at the University of Durham in 1851, being elected a Fellow there in 1852. In 1857 he was appointed Vicar of S. Lawrence, York, which he vacated in 1868 for the combined Rectory of S. Michael's, Spurriergate, with the Rectory of St. Crux and All Saints, Pavement. The former parish he resigned in 1885, retaining only the latter two, where he faithfully laboured until the time of his death. In 1866 Archbishop Thomson appointed him Canon of York Minster, and in 1888 made him a Residentiary. In 1891 Archbishop Magee promoted him, on the resignation of the late Lord Forester, to be Chancellor of the Cathedral Church.

He was singularly quiet and unassuming in his manner, and early devoted himself to those habits of patient study and investigation which gradually led to his being recognised as one of the greatest of Northern Archæologists. He will be long remembered as one of the leading spirits of the Surtees Society, and was for many years its secretary, and Editor of many of its most valuable publications. He also wrote a well-

known book on York in the "Historic Towns" series. In recognition of his Archæological acquirements his University conferred on him, in 1882, the honorary degree of D.C.L.

He was identified with various local bodies of a philanthropic, literary and educational character. He was a manager of the Savings Bank, held the office of Chaplain to the York Merchant Adventurers' Company and Merchant Taylors' Company—two of the old Guilds which still survive as remnants of the days when both masters and men in one trade combined in one society for mutual advantage. He was Honorary Librarian of the York Minster Library, and at the time of the establishment of the Public Library in York he was asked by the Corporation to act on the Committee, and rendered most valuable assistance in the selection of books. He also gave much time and care to the preservation and repair of the ancient charters and documents belonging to the Corporation which were injured by the great flood of 1892.

He married Annie, daughter of the late Henry Keyworth, of this city, surgeon, and leaves a large family. It is melancholy to think that we shall never again see his genial face within these walls; but his memory will be perpetuated in the Museum by an oil painting and by his own private collection of antique glass, part of which is now in the Ethnological Room.

STATION, YORK.—THE MUSEUM.

Longitude 1° 5' W., Latitude 53° 57' N. Height above Mean Sea Level 56 feet. Gravity Correction + 0.24 in.

1896.	Highest Barometer.	Lowest Barometer.	Mean Pressure at 32° Fahren- heit at M.S. Level	Air Temperature.						Humidity.					
				Means of			Absolute Min. and Max.			Depn. of Wet Bulb.			Tension of Vapour.		
				Min. & Max.	Min.	Max.	Min.	Date.	Max.	9 a.m.	9 p.m.	Mean.	9 a.m.	9 p.m.	Mean.
				°	°	°	°		°	°	°	°	in.	in.	in.
				°	°	°	°		°	°	°	°	%	%	%
January	9th, 9 p.m. 30.989	15th, 9 a.m. 29.216	30.295	41.1	36.1	46.1	25.0	21, 31	55.0	1.1	1.3	1.2	.228	.233	.231
February	3rd, 9 a.m. 30.751	20th, 9 a.m. 29.649	30.288	40.8	35.1	46.4	24.0	26th	56.0	1.2	1.3	1.3	.214	.230	.222
March	10th, 9 a.m. 30.274	3rd, 9 p.m. 28.605	29.716	43.8	36.4	51.1	30.0	13, 31	66.0	2.3	2.1	2.2	.235	.238	.237
April	21st, 9 a.m. 30.513	29th, 8 a.m. 29.579	30.108	48.5	40.3	56.7	30.5	2nd	65.4	3.7	3.2	3.5	.267	.252	.260
May	25th, 9 p.m. 30.511	20th, 8 a.m. 29.757	30.264	53.1	42.3	63.8	30.0	4th	78.6	4.9	3.4	4.2	.311	.291	.301
June	19th, 9 p.m. 30.197	7th, 6 p.m. 29.532	29.925	60.9	51.2	70.6	42.0	1st	84.0	4.7	3.2	4.0	.413	.387	.400
July	11th, 9 a.m. 30.326	25th, 9 p.m. } 29.655 26th, 8 a.m. }	29.996	61.5	52.1	70.8	45.0	28th	84.6	5.0	3.2	4.1	.416	.412	.414
August	10th, 9 a.m. 30.282	26th, 9 a.m. 29.577	30.004	57.5	49.6	65.3	42.0	28th	71.3	3.8	2.8	3.3	.382	.370	.376
September	30th, 9 p.m. 30.485	25th, 9 a.m. 28.773	29.706	56.5	49.0	63.0	37.0	21st	72.0	2.1	1.9	2.0	.381	.375	.378
October	1st, 9 a.m. 30.416	19th, 9 a.m. 29.159	29.695	44.1	37.7	50.5	24.0	27th	63.0	1.8	1.2	1.5	.259	.260	.260
November	25th, 9 a.m. 30.660	14th, 9 p.m. 29.209	30.151	41.1	35.8	46.4	23.6	6th	51.0	1.3	1.4	1.4	.226	.228	.227
December	29th, 9 a.m. 30.289	6th, 6 p.m. 28.787	29.727	38.7	34.1	43.3	24.7	17th	55.4	0.8	0.9	0.9	.222	.229	.226
Year	Jan. 9th, 31.005 3½ p.m.*	Mar. 3rd, 28.585 7 p.m.*	29.990	48.9	41.6	56.2	23.6	Nov. 6th.	84.6	2.7	2.2	2.5	.296	.292	.294

* Official returns (30.989 at 9 p.m.), combined with recording barometer tracing, about 0.015 higher at 3½ p.m., Min. 28.605 at 9 p.m. was 0.02 higher than at 7 p.m.

STATION, YORK.—THE MUSEUM.

Barometer 3 feet above ground. Thermometers 4 feet above ground. Rain-gauge 1 foot above ground.

1896.	Amount of Cloud.			Rainfall.		Sunshine Returns.			Weather, No. of Days of								Wind, No. of Observations of										
	9 a.m.	9 p.m.	Mean	Total.	Max.	Day	Total hours. 1896.	Per-centage 1896.	Per-centage 1895.	Rain, Snow, &c.	Frosts.	Snow.	Hail.	Thun-der Storms	Clear Sky	Over-cast	Gale	Visi-bility.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm
January	6.7	7.2	7.0	ins. 0.50	ins. .17	13th	35	15	27	12	17	0	0	0	3	14	1	4	5	0	1	2	15	7	23	8	1
February	7.6	7.0	7.3	0.67	.24	20th	27	10	37	7	16	0	0	0	1	14	0	20	1	2	7	8	13	10	14	3	0
March	5.3	5.4	5.4	2.61	.43	13th	96	26	23	24	15	2	1	1	3	8	3	14	6	2	3	3	11	5	24	8	0
April	5.5	4.9	5.2	0.85	.19	10th	148	35	36	15	8	0	1	1	2	5	1	23	9	1	4	1	3	1	29	12	0
May	4.8	5.2	5.0	0.45	.37	21st	188	38	43	5	4	0	0	1	9	9	0	7	20	9	12	2	0	1	11	7	0
June	5.7	4.8	5.3	2.72	.49	7th	183	36	38	15	0	0	0	10	2	4	0	22	7	3	9	6	9	2	15	9	0
July	5.8	6.2	6.0	1.59	.41	9th	161	32	33	13	0	0	0	3	4	9	0	8	9	2	11	4	8	4	17	7	0
August	7.6	7.0	7.3	2.25	.47	30th	103	23	33	14	0	0	0	4	0	13	0	?	16	3	2	3	5	4	20	8	1
September	7.0	7.0	7.0	2.87	.61	24th	273	219	54	22	0	0	0	2	2	13	0	7	7	1	9	4	16	7	12	2	2
October	6.7	6.3	6.5	2.80	.42	6th	68	21	38	25	12	0	0	1	3	9	2	2	19	3	3	2	15	6	6	8	0
November	7.0	6.5	6.8	1.57	.44	7th	53	21	11	12	14	0	1	0	2	12	0	0	12	4	8	2	10	4	14	5	1
December	7.1	7.9	7.5	3.10	.56	4th	27	12	8	26	19	4	0	0	3	16	0	0	10	1	8	4	17	8	8	4	2
Year	6.4	6.3	6.4	21.98	.61	Sept 24th	1162	24.0	31.8	190	105	6	3	23	34	126	7	87	121	31	77	41	122	59	193	81	7

Auroras, March 4 (2); March 8 (1); October 10 (2). May 11th, cloudless.

RIVER HEIGHT RECORDS REGISTERED BY THE AUTOMATIC RECORDER
AT GUILDHALL, YORK, 1896.

Date.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		MAY.		JUNE.	
	Time.	Above or below S.L. ft. in.	Time.	Above or below S.L. ft. in.	Time.	Above or below S.L. ft. in.	Time.	Above or below S.L. ft. in.	Time.	Above or below S.L. ft. in.	Time.	Above or below S.L. ft. in.
1	1 a.m.	7 4	noon.	1 0	m'dnight	2 6	11 p.m.	1 6	6 a.m.	1 0	noon.	below 4 0
2	"	3 7	"	1 0	noon.	3 0	3 a.m.	1 6	noon.	0 9	6 p.m.	4 0
3	2 p.m.	6 2	1 a.m.	1 0	m'dnight	6 7	1 a.m.	1 3	"	0 8	noon.	4 0
4	1 a.m.	4 9	noon.	0 10	2 a.m.	6 10	m'dnight	1 4	"	0 8	"	4 0
5	"	1 6	"	0 10	"	3 6	noon.	1 4	"	0 8	6 a.m.	3 10
6	5 p.m.	1 7	"	0 9	m'dnight	5 0	1 a.m.	1 4	"	0 8	11 p.m.	4 3
7	1 a.m.	1 3	"	0 9	10 a.m.	8 9	noon.	1 3	"	0 7	1 a.m.	4 2
8	m'dnight	1 4	"	0 10	1 a.m.	5 5	"	1 3	"	0 7	6 a.m.	above 0 5
9	6 a.m.	1 5	6 p.m.	2 5	noon.	4 8	"	1 2	"	0 6	11 a.m.	2 4
10	noon.	1 2	1 a.m.	2 0	1 a.m.	3 0	"	1 2	"	0 6	1 a.m.	0 9
11	7 a.m.	1 1	"	1 1	3 p.m.	1 10	6 p.m.	1 0	"	0 6	"	0 4
12	noon.	1 0	noon.	1 0	1 p.m.	1 5	"	1 0	"	0 6	m'dnight	below 0 4
13	1 a.m.	1 0	"	0 10	m'dnight	1 2	"	1 0	10 p.m.	0 7	9 a.m.	1 3
14	11 p.m.	1 1	"	0 11	"	1 5	11 a.m.	1 2	noon.	0 5	noon.	above 0 7
15	2 p.m.	1 5	"	0 9	3 p.m.	1 7	noon.	1 0	"	0 6	m'dnight	0 6
16	3 p.m.	3 6	"	0 8	m'dnight	5 6	"	1 2	"	0 7	noon.	0 6
17	5 p.m.	2 4	m'dnight	0 8	3 a.m.	5 9	5 p.m.	1 1	"	1 7	"	0 6
18	m'dnight	1 10	6 a.m.	0 5	1 a.m.	3 2	1 a.m.	1 5	"	0 6	"	0 6
19	2 a.m.	1 11	6 p.m.	0 10	"	2 7	"	1 5	"	0 6	"	0 7
20	10 p.m.	1 4	noon.	0 8	4 p.m.	1 9	6 p.m.	1 0	"	0 6	"	0 6
21	1 a.m.	1 3	11 p.m.	1 1	6 p.m.	2 6	noon.	1 0	"	0 6	"	0 6
22	noon.	0 10	6 p.m.	1 5	1 a.m.	1 11	"	1 0	"	0 7	"	0 6
23	"	0 10	6 a.m.	1 4	6 a.m.	1 6	"	1 0	"	0 7	"	0 5
24	"	0 10	noon.	1 0	"	1 7	"	1 0	"	0 7	"	0 5
25	7 p.m.	6 0	"	1 0	"	1 8	1 a.m.	0 11	"	0 6	m'dnight	0 7
26	1 a.m.	5 6	"	0 10	10 a.m.	1 11	noon.	0 8	"	0 6	6 a.m.	0 7
27	noon.	2 11	"	0 10	9 a.m.	3 2	"	0 8	"	0 6	noon.	0 5
28	4 p.m.	2 3	"	0 10	2 p.m.	3 4	9 p.m.	1 0	"	0 6	"	0 5
29	3 p.m.	1 11	6 a.m.	0 10	10 a.m.	2 10	10 a.m.	0 11	"	0 3	"	0 3
30	10 p.m.	1 4	m'dnight	0 10	2 p.m.	3 3	noon.	1 2	"	0 3	m'dnight	0 6
31	noon	1 4	"	1 9	"	1 9	"	1 2	8 a.m.	1 1	"	0 0

RIVER HEIGHT RECORDS.—Continued.

Date.	JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.	
	Time.	Above or below S.L. ft. in.	Time.	Above or below S.L. ft. in.	Time.	Above or below S.L. ft. in.	Time.	Above or below S.L. ft. in.	Time.	Above or below S.L. ft. in.	Time.	Above or below S.L. ft. in.
1	6 p.m.	0 8	6 p.m.	0 11	noon.	0 4	6 a.m.	1 6	noon.	1 6	6 a.m.	0 9
2	1 a.m.	0 7	1 a.m.	0 10	"	1 6	noon.	1 2	2 p.m.	3 1	noon.	0 6
3	noon.	0 5	"	6 7	m'dnight	2 3	"	1 3	10 a.m.	1 7	m'dnight	2 0
4	"	0 5	noon.	0 4	11 a.m.	3 5	6 a.m.	1 2	6 a.m.	1 4	"	4 10
5	"	1 5	"	0 6	1 a.m.	2 2	m'dnight	2 6	noon.	1 2	"	9 2
6	"	0 4	m'dnight	0 6	6 a.m.	0 9	9 a.m.	3 4	"	1 0	3 a.m.	9 3
7	"	0 5	noon.	0 5	noon.	0 6	noon.	5 8	"	0 11	1 a.m.	7 9
8	"	0 5	"	0 6	"	0 6	3 p.m.	6 4	m'dnight	3 6	"	6 2
9	"	0 5	"	0 6	"	0 6	1 a.m.	5 11	1 a.m.	3 7	2 a.m.	3 5
10	m'dnight	1 7	"	0 6	3 p.m.	4 2	"	2 2	6 p.m.	2 3	9 a.m.	2 10
11	1 a.m.	1 7	"	0 5	1 a.m.	3 3	2 p.m.	3 0	"	2 0	10 p.m.	3 6
12	"	0 9	1 a.m.	0 6	noon.	0 11	7 p.m.	3 11	3 a.m.	2 0	1 a.m.	3 6
13	6 a.m.	0 4	noon.	0 3	5 p.m.	1 8	4 a.m.	3 10	1 a.m.	1 7	10 a.m.	2 9
14	noon.	0 3	"	0 3	6 p.m.	1 8	1 a.m.	3 2	m'dnight	1 10	1 a.m.	3 1
15	m'dnight	0 5	"	0 4	"	2 0	noon.	2 9	5 p.m.	2 9	3 p.m.	2 1
16	noon.	0 5	"	0 4	8 a.m.	3 6	m'dnight	3 0	9 a.m.	2 5	4 p.m.	2 2
17	"	0 5	"	0 4	1 a.m.	2 0	6 a.m.	3 3	4 p.m.	1 11	6 p.m.	1 11
18	"	0 4	"	0 4	m'dnight	1 11	1 a.m.	1 7	6 p.m.	1 6	1 a.m.	1 10
19	"	0 4	"	0 4	2 a.m.	2 0	2 p.m.	1 7	1 a.m.	1 5	noon.	1 6
20	"	0 4	"	0 4	3 p.m.	1 7	noon.	1 9	6 a.m.	1 3	"	1 6
21	m'dnight	0 5	"	0 4	1 a.m.	1 6	"	1 5	noon.	1 3	"	1 6
22	11 p.m.	0 6	"	0 4	11 p.m.	0 11	"	1 4	1 a.m.	1 1	"	1 6
23	noon.	0 5	"	0 4	7 p.m.	5 4	1 p.m.	2 2	noon.	0 11	"	1 6
24	"	0 6	"	0 4	1 a.m.	4 11	1 a.m.	2 1	"	0 11	6 a.m.	1 6
25	m'dnight	1 5	"	0 3	m'dnight	5 0	4 p.m.	2 6	"	0 9	8 p.m.	4 6
26	9 a.m.	2 7	"	0 3	noon.	7 8	6 p.m.	1 7	"	0 8	m'dnight	6 8
27	1 a.m.	1 10	"	0 3	1 a.m.	4 11	10 p.m.	1 6	"	0 8	6 a.m.	7 2
28	"	0 9	"	0 3	5 p.m.	3 11	6 p.m.	1 11	"	0 7	1 a.m.	5 9
29	noon.	0 6	"	0 3	1 a.m.	3 3	m'dnight	1 8	11 p.m.	0 10	10 a.m.	6 5
30	"	0 6	"	0 3	"	1 7	3 a.m.	1 8	noon.	0 10	m'dnight	6 9
31	9 p.m.	0 8	"	0 3	"	1 7	noon.	1 8	"	0 10	1 a.m.	6 10

HOUSE FLOODS FROM RETURNS TO THE CITY SURVEYOR.
COMPARATIVE TABLE, 1896.

Date.		Nidd at Pateley Bridge.		Ure at Middleham Bridge.		Swale at Richmond.		Date.		York, Guildhall Gauge.				
		Hour.	Height	Hour.	Height	Hour.	Height			Maximum flood.		Hours from :--		
										Hour.	Height	Patel'y	Mid-dleham	Rich-mond.
			ft. in.		ft. in.		ft. in.							
Jan.	2			4 p.m.	5 1			Jan.	3	2 p.m.	6 2		22	
"	3			8 a.m.	3 6			"	16	3 p.m.	3 6		23	
"	15			4 p.m.	6 0			"	25	7 p.m.	6 0		?	
"	24			3-30 p.m.	3 0			"	26	1 a.m.	5 6			
"	25			7 a.m.	6 4			Mar.	4	2 a.m.	6 10		17	19
Mar.	1			noon.	4 10			"	7	10 a.m.	8 9	19	14½	17½
"	3			9 a.m.	9 0	7 a.m.	5 0	"	17	3 a.m.	5 9	18	15	17
"	6	5 p.m.	6 6	7-30 p.m.	10 6	4-30 p.m.	4 0	"	27	9 a.m.	3 2		21	
"	7	9 a.m.	2 0	8-40 a.m.	3 3			"	28	2 p.m.	3 4			
"	8			4 0 p.m.	5 6			July	11	1 a.m.	1 7		20	
"	9			7 a.m.	4 0			"	26	9 a.m.	2 7		14½	16
"	16	9 a.m.	4 0	2 p.m.	6 0	10 a.m.	3 0	Aug.	25	noon.	0 3		?	
"	26			noon.	3 1			Sep.	4	11 a.m.	3 5		?	
July	10			5 a.m.	3 0			"	10	3 p.m.	4 2		15	
"	25			6-30 p.m.	5 10	5 p.m.	3 0	"	16	8 a.m.	3 6		12	15
Aug.	24			2 p.m.	3 11			"	18					
Sep.	4			10 a.m.	4 1			"	20					
"	9			midnight	5 0			"	22					
"	10	9 a.m.	2 0	6 a.m.	1 10			"	23	7 p.m.	5 4			23
"	15			8 p.m.	8 0	7 p.m.	3 0	"	24	1 a.m.	4 11		20	
"	16			6 a.m.	3 0			"	25	midnight	5 0			
"	18			"	3 0			"	26	noon.	7 8		20	21
"	20			"	2 7			Oct.	7	noon.	5 8		18	
"	22					8 p.m.	3 0	"	8	3 p.m.	6 4			
"	23			5 a.m.	6 0									
"	25			4 p.m.	6 0	3 p.m.	3 6							
"	26			6 a.m.	2 6									
"	27			6 p.m.	6 0	6 p.m.	3 0							
"	28			"	6 0									
Oct.	6	7-30 a.m.	3 0	6 a.m.	2 11									
"	7			"	4 0									
"	8			6 a.m.	4 6									
"	9			"	3 2									
										Average interval		18½	18½	18½
										Miles from York ..		35	45	45

ADDITIONAL RETURNS SUPPLIED BY R. THOMPSON, Esq.

1896.	RAINFALL, CHERRY HILL, YORK.				ILKLEY.		BRIGHT SUNSHINE, THE HERMITAGE, OSWALDKIRK.	
		Greatest depth in 24 hours.		Number of dayson which·01 or more rain fell.	CHERRY BANK ILKLEY.	Number of dayson which·01 or more rain fell.	Hours.	Percentage of actual to possible.
		Inches.	Inches.					
Jan.	·44	·17	13	10	1·37	7	52·40	21·74
Feb.	·65	·22	20	8	1·00	5	41·00	15·35
Mar.	2·26	·46	13	22	2·50	12	113·25	31·11
April	·68	·16	10	13	2·61	10	160·50	38·39
May	·49	·37	21	6	·62	4	194·60	39·55
June	2·43	·48	7	15	4·41	10	186·50	36·85
July	1·28	·18	9	13	2·31	7	164·40	32·49
Aug.	2·15	·36	31	15	1·85	12	94·40	20·74
Sept.	2·92	·70	24	24	5·74	20	97·65	26·11
Oct.	3·26	·44	7	28	6·01	16	72·55	25·79
Nov.	1·42	·44	7	12	1·71	7	66·90	26·86
Dec.	3·14	·55	4	26	4·73	8	29·70	13·37
Total	21·12			192	34·86	118	1273·85 out of 4,414 h'rs 'possible'	28·86

DIFFERENCES IN 1895 FROM MEANS.

Columns 1—6 for fifty years, 1841—90; Columns 7—10 for ten years.

	Mean Barometer.	Thermometer.			Rain.	Rainy Days.	Mean Rel. Humidy. 1881-90.	Sunshine. (1881—1890).		Visibility. 1883-1892.
		Min.	Max.	Mean of both.				Hours.	Per-centage.	
Jan.	+ 0·46	+ 3·9	+ 4·6	+ 4·2	— 1·24	— 2½	— 0·3	+ 9½	+ 4·4	+ 2
Feb.	+ 0·37	+ 2·1	+ 2·9	+ 2·6	— 0·85	— 6	+ 1·2	— 26	— 9·5	? — 2
Mar.	— 0·16	+ 2·3	+ 4·1	+ 3·2	+ 0·94	+ 10	— 2·7	— 2½	— 0·9	+ 8
April	+ 0·21	+ 2·3	+ 3·1	+ 2·6	— 0·76	+ 1½	— 4·8	+ 20	+ 4·4	+ 16
May	+ 0·31	— 0·6	+ 4·2	+ 1·8	— 1·36	— 8	— 2·5	+ 1	+ 0·2	+ 1
June	— 0·03	+ 2·0	+ 4·6	+ 3·3	+ 0·48	+ 2½	— 0·2	+ 14½	+ 2·5	+ 17
July	+ 0·08	0·0	+ 2·6	+ 1·4	— 1·07	— 0½	— 2·4	— 0½	— 0·1	? + 3
Aug.	+ 0·09	— 2·3	— 2·0	— 2·1	— 0·44	0	— 1·3	— 44½	— 8·9	?
Sept.	— 0·22	+ 1·2	+ 1·5	+ 1·4	+ 0·47	+ 8½	+ 1·0	?— 32½	?— 13·5	+ 1
Oct.	— 0·14	— 4·1	— 4·0	— 4·1	+ 0·18	+ 8	+ 1·4	— 12½	— 4·1	— 2
Nov.	+ 0·28	— 0·5	— 0·4	— 0·5	— 0·52	— 4½	+ 0·1	+ 11	+ 4·1	0
Dec.	— 0·17	+ 1·1	+ 1·0	— 1·0	+ 1·14	+ 11	+ 2·3	+ 2½	+ 1·5	0
Year Actual Value.	+ ·086 (29·990)	+ 0·6 (41·6)	+ 1·8 (56·2)	+ 1·2 (48·9)	— 3·03 (21·98)	+ 19½ (190)	— 0·6 (83·9)	— 60½ (1162)	— 2¾ (24·0)	+ 44 (87)

THE TREASURER IN ACCOUNT WITH THE YORKSHIRE Dr. INCOME.

	£	s.	d.	£	s.	d.
<i>Subscriptions :—</i>						
Town Members	627	0	0			
Country Members	18	0	0			
Temporary Members	2	0	0			
Lady Subscribers	56	0	0			
Associates	10	0	0			
Arrears received	13	10	0			
For Keys of Gates	53	18	6			
				780	8	6
<i>Rents :—</i>						
Major Allenby, St. Mary's Lodge	65	0	0			
Mr. Hill, Marygate Baths	40	0	0			
York Amateur Rowing Club	5	0	0			
York and District Field Naturalists' Society, less £1 paid to Attendant	2	0	0			
York Waterworks Company	0	1	0			
Bootham and Marygate Towers (3 months)	6	0	0			
Corporation of York	2	0	0			
				120	1	0
Hire of Tent and Table	7	13	4			
Less expenses of carriage, fixing, &c.	2	13	4			
				5	0	0
Meteorological Department				15	12	0
Whitsuntide Admission Fees	12	19	6			
<i>Less :</i>						
Attendants and Police	4	14	0			
Joiners fixing barricades and new wood for same	1	16	11			
				6	10	11
				6	8	7
Sale of Catalogues				8	8	0
Sale of Photographs				3	7	3
Sale of Duplicate sets of Labels				1	0	6
Bank Interest				4	7	6
Gate Money				226	11	10
				1171	5	2
Excess of Expenditure over Income				85	17	11

£1257 3 1

Balance in hands of the Treasurer, 31st December, 1896

71 10 8

£71 10 8

Examined and found correct, January 26th, 1897,
J. A. CUNNINGHAME.

PHILOSOPHICAL SOCIETY for the Year ending 31st Dec., 1896.

EXPENDITURE.						Cr.			
	£	s.	d.	£	s.	d.	£	s.	d.
Crown Rent							1	0	0
Corporation Rent							19	8	4
<i>Rates and Taxes:—</i>									
Rates and Taxes, Parishes of St. Wilfrid and St. Olave				31	11	8			
Waterworks Co.'s Rate				1	17	6			
Gardeners' Licenses				2	5	0			
Receipt Book Stamping				1	9	2			
				—	—	—	37	3	4
Insurance							7	5	0
<i>Salaries and Wages:</i>									
Mr. Platnauer				150	0	0			
Mr. Fielden				60	0	0			
Miss Baines				40	11	0			
Mr. Guy				25	0	0			
<i>Attendants at Museum and Hospitium, viz:</i>									
Attendant at Museum	65	0	0						
Female Attendant at Museum	27	6	0						
Female Attendant at Hospitium	32	10	0						
	—	—	—	124	16	0			
Gardeners, including temporary labour and extra duty at Gates, &c.				103	0	6			
				—	—	—	503	7	6
Yorkshire Insurance Company — Annuity							197	17	8
<i>General Repairs and Expenses:</i>									
Museum and Hospitium—Additions, Repairs and Expenses				30	14	2			
<i>Gardens:</i>									
General Additions, Repairs and Expenses	41	15	4						
Asphalting	24	5	7						
Tennis Court making and keeping in order	10	8	0						
	—	—	—	76	8	11			
<i>Estate:</i>									
<i>Builders' and Joiners Work, viz.:</i>									
Drainage	39	3	11						
Repairs to Roofs of Hospitium and Museum	9	1	3						
Repairs to Ruins	18	9	0						
New Spouting to Hospitium	7	0	0						
New Fencing at St. Mary's Lodge	4	14	6						
Repairs to Roofs at Baths	3	2	4						
Sundry small repairs	1	19	8						
	—	—	—	83	10	8			
Plumbers' and Smiths' work				12	4	6			
				—	—	—	95	15	2
							202	18	3
Library							31	13	9
Lectures							56	12	10
Printing and Stationery							8	7	5
Printing Reports and Postage thereof							19	6	0
Printing Communications to Members and Postages of same							5	3	3
<i>Gas, Coal, and Coke:</i>									
Museum				25	2	1			
Gardens				10	1	9			
Estate				15	17	6			
				—	—	—	51	1	4
Antiquarian Department							40	11	5
Ornithological Department							23	2	6
Meteorological Department							17	15	0
Preparing Photographs for Sale							1	7	4
Catalogues							11	13	4
Legal Charges							5	0	0
Sundry Postages							8	5	3
Military Bands							6	1	0
Sundries including carriage of parcels and firewood							2	2	7
							—	—	—
							£1257	3	1
Balance in hands of Treasurer, 31st December, 1895							157	8	7
Excess of Expenditure over Income, 1896							85	17	11
							—	—	—
							£71	10	8

E. GRAY, Hon. Treasurer.

NEW MEMBERS.—1896.

Barnby, Mrs., *St Mary's House*.
 Beaumont, Lewin, *Micklegate*.
 Bethell, Major, 32, *St. Mary's*.
 Bishop, Rev. H. E., *Clifton*.
 Bradshaw, Thos., *Feasegate*.
 Brierley, Walter H., *New Walk Terrace*.
 Britton, Geo. H., *Riversleigh, Queen Anne's Road*.
 Buchan, Jas., 5, *Grosvenor Terrace*.
 Cooper, M. L., *Stonegate*.
 Frater, Rev. W. D., 27, *St. Mary's*.
 Fry, C., *St. Catherine's, Clifton*.
 Hopton, H. S., *St. Leonard's*.
 Hutton, Miss, *Priory House, Micklegate*.
 Kirsopp, Thos., 58, *Bootham*.
 Long, E. D., 32, *Queen Anne's Road*.
 Nicholson, J. A., 6, *Lord Mayor's Walk*.
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The Report of the British Association for the Advancement of Science, Ipswich, 1895.	
Memoirs and Proceedings of the Manchester Literary and Philosophical Society. 4th series, vol. x., Nos. 1, 2, 3, vol. xli. (old) No. 1, and List of Members and Officers.	The Society.
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Records of the Geological Survey of India, (Palæontologia), series xiii, vol. ii., parts 1, 2, and vol. xxvii, part 1. Records vol. xxix, parts 1, 2, 3, 4.	
Catalogue of Birds, vols. xxiv., xxv., xxvii.; of Snakes, vol. iii.; of Madreporaria, vol. ii.; of Fossil Fishes, part 3, of Fossil Plants of the Wealden, part 2, of Jurassic Bryozoa, an introduction to the Study of Rocks, and Guide to the Mycetozoa in the British Museum.	The Smithsonian Institution.
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- Transactions of the Zoological Society of
London, vol. xiii., part 2, vol. xiv.,
parts 1 & 2. Proceedings, parts 3 & 4,
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Animals in the Society's Gardens. } The Society.
- The Proceedings of the Royal Institution
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- The Proceedings of the Geologists'
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Edinburgh, vol. xxxv., parts 3 & 4,
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and Philosophical Society. New Series,
vol. iv., parts 3, 4, 5, 6. } The Society.
- The Journal of the Manchester Geo-
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and Supplement, 1895. } The Society.
- The Reminiscences of a Yorkshire Natura-
list, Prof. W. C. Williamson. Edited
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- The Transactions of the Natural History
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Gasteropoda, part 1, No. 9, by W. H.
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- Report on the Eruption of Ambrym
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Society, vol. x., No. 4, vol. xiii., No. 2,
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vol. xv., Nos. 1, 2. } The Society.

Transactions of the Imperial Mineralogical Society of Russia, 1895.	} The Society.
The Proceedings and Transactions of the Nova Scotian Institute of Science, vol. viii., being vol. i., Second Series and vol. ix., part 1.	} The Institute.
The Proceedings of the Rochester Academy of Sciences, vol. ii., Nos. 3, 4, and vol. iii.	} The Academy.
The Transactions of the Meriden Scientific Association, vol. vii., 1895.	} The Association.
The Transactions of the Wisconsin Academy of Science, Arts, and Letters, vol. x., 1894-5.	} The Academy.
Tuff's College Studies, No. 4.	The College.
The Bulletin of the Geological Institution of the University of Upsala, vol. ii., part 2, No. 4.	} The University.
The Transactions of the Burton-on-Trent Natural History and Archæological Society, vol. iii., part 2.	} The Society.
Nova acta der Kaisl. Carol. Deutschen Akademie der Naturforscher; Leopoldina, 1895.	} The Academy.
Annalen des K. K. Naturhistorischen Hofmuseums, 1895.	} The Director.
Mitteilungen des Vereins für Erdkunde zu Leipzig, 1895.	} The Society.
Annual Report of the Department of Mines and Agriculture of New South Wales for 1895.	} The Department of Mines
Memoirs of the Indian Meteorological Society, vol. vii., part 5, and vol. viii., part i. Cloud and Monthly Current Charts of the Indian Ocean.	} The Society.
Bergen Museum Aarsberetning for 1894-5.	The Council.
Report and Proceedings of the Belfast Natural History and Philosophical Society, 1895-6.	} The Society.
The Proceedings of the British Naturalists' Society. New Series, vol. viii., Part 1, and list of Members.	} The Society.

Transactions of the Perthshire Society of Natural Science, vol. ii., part 4.	} The Society.
Transactions of the Rochdale Literary and Scientific Society, vol. ii, iii., iv., and 17th Annual Report	} The Society.
Proceedings of the Bath Natural History and Antiquarian Field Club, vol. viii., No. 3.	} The Club.
The Journal of the Northamptonshire Natural History Society, Nos. 61, 62, 63, 64.	} The Society.
Transactions of the Natural History Society of Glasgow, vol. iv. New Series, part 2.	} The Society.
Journal of the Liverpool Geological Association, vol. xv., 1894-5.	} The Association.
The Transactions of the Yorkshire Naturalists' Union, part 20.	} The Union.
Inventaire général des Richesses d'Art de la France, vol. vi.	} The Society.
Report of the Council of the Meteorological Society to the Royal Society for the year ending 31st March, 1895, and Daily and Weekly Weather Reports for 1896	} The Society.
Proceedings of the Warwickshire Naturalists' and Archæologists' Field Club, 40th Annual Report, 1895.	} The Club.
Calendar of the Yorkshire College, Leeds, for 1896-7, and 21st and 22nd Annual Reports.	} The College.
Account of the Excavation of Birrens, a Roman Station in Annandale.	} The Society of Antiquaries of Scotland.
Boletin of the National Astronomical Observatory of Tacubaya, vol. i., Nos. 24, 25.	} The Director.
Bolletini della Biblioteca Nazionale Centrale di Firenze, 1896.	} The Librarian.
An account of the Crustacea of Norway, vol. ii. Isopoda, parts 1, 2, by G. O. Sars.	} The Author.

Boletin Mensual Meteorológico y Agricolo del Observatorio central del Estado de Vera cruz Llave, for 1896	} The Society.
Annual Report of the Leeds Literary and Philosophical Society for 1895-6.	} The Society.
Annual Report of the Sheffield Naturalists' Club, 1895.	} The Club.
Report of the Manchester Museum, Owen's College, with Appendices, 1895-6.	} The Council.
The 30th Annual Report of the Wood- wardian Museum and Lecture Room Syndicate for 1895.	} The Council.
Reports of the Bristol Museum Com- mittee, 1893-4 ; 1895-6.	} The Committee.
Annual Report of the Cardiff Museum and Art Gallery, 1895-6.	} The Council.
Annual Report of the Bradford Free Libraries.	} The Librarian.

GEOLOGICAL DEPARTMENT.

A Collection of Lias and other Fossils.	{ Miss Wainwright, Cheltenham.
Two Gryphæas and a large Fossiliferous block from the Stillington Crag.	} Mr. G. C. Dennis.
Some derived fossils from a cutting at Scarcroft, York.	} The Rev. Canon Raine.
A small Series of Fossils from Saltburn.	{ Surgeon Colonel Donaldson.
Two Specimens of <i>Ægoceras capricornum</i> , from Staithes	} Mr. J. F. Walker.
Ten Specimens of <i>Rhynchonella bidens</i> from Peak.	} Mr. Geo. Oldfield, Malton.
A Series of Fossils from the Muschelkalk and Specimens of Jurassic Ammonites from Germany.	} Dr. Pfarrer Engel.

MINERALOGY.

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A Small Series of Polished Pebbles.	Mrs. Palmes, Lincroft, York.
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ZOOLOGY AND COMPARATIVE ANATOMY.

A white Mole, from Flintshire.	{ Miss Lloyd Fletcher, Nerquis Hall, Mold, Flintshire.
A Specimen of <i>Platypteryx falcula</i> , taken at Hazelbush, York.	{ Captain Barstow, R.N.
A clutch of eggs of the Phalarope (4), Two Golden Eye Duck, Two Eared Grebe, and One Tern, from Iceland.	{ Dr. Tempest Anderson.
A curious Egg of the Lapwing from near York.	{ Mr. M. R. Bullivant.
A Leache's Petrel, a great Snipe, and a Scaup Duck, shot in Wensleydale.	{ Lord Bolton.
Very fine Specimen of Coral from Jamaica.	{ Miss Wilson, St. Peter's Grove.
A vegetable Caterpillar, recent Shells, etc., from New Zealand.	{ The Rev. Canon Machell.
Two Specimens of <i>Squilla mantis</i> from the Adriatic.	{ Mr. G. Glaisyer, Vale View, Malton.

ANTIQUITIES.

36 Trademen's tokens of the 17th Century, belonging to the County of Durham.	{ Rev. Canon Raine.
Part of a finely Sculptured Norman Cross from Whixley.	
A large Stone Hammer from Newton-on- Derwent.	{ Mr. J. Backhouse.
A Cannon Ball and a large Jar, glaized inside, found in St. George's Field.	{ Mr. J. W. Wright, 14, Moss Street, York.
Two casts of Monastic Seals.	{ Mrs. King, Burton Lane.

BOTANY.

A Series of <i>Arenaria gothica</i> from Ribble- head, Ingleton, Yorkshire. Specimens of <i>Polygala austriaca</i> and <i>Polygala</i> <i>calcareo</i> , from Surrey.	{ Mr. W. Whitwell.
A Specimen of <i>Cotula coronopifolia</i> from near Birkenhead.	{ Miss B. M. Keyworth.

MISCELLANEOUS.

A Series of Casts of Antique Vases.	Miss Atkinson.
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A SYNOPSIS OF THE
CRUSTACEA AND ECHINODERMATA
OF THE
UPPER TERTIARIES.

With the exception of a very few species, which occur in some numbers, the organisms given in the following lists are rarely met with, and then usually in a more or less imperfect state of preservation, the Crustacea appearing as odd members and portions of the carapace, or in the chitinous remains of the exoderm, the Starfishes as fragments of the rays, and the Echini by plates and spines, except some in the quieter silts of the Coralline Crag, Suffolk, and the muddy estuarine clays of N. Ireland. It is therefore hardly to be wondered at that so little has been achieved in the elucidation of these faunas, and their occurrence and distribution in the later Tertiaries.

Patient research and the determination of the species of "Crab Claws" so often met with in lists of fossils, ample enough otherwise where mollusca are concerned will, however, do much in this direction, as out of 80—90 species of the hard-shelled decapodous crustacea known to Britain, 20 species have been determined in a fossil state, of which number more than half are known from single examples, mostly fragmentary, chiefly chelæ or claws.

As a rule the most perfect examples are the shore crabs and those species inhabiting the laminarian or bryozoan zones of the Coralline Crag, where the sands and banks were not much disturbed when deposited. The swimming crabs are usually represented by separated fingers or limb joints (specimens of the carapace rarely occurring in either of these deposits) and commoner in the Scottish pleistocene beds or in the estuarine clays of N.E. Ireland than in the earlier Crag. The Lobster group is but feebly represented. I have only been able to note from my own observations the fragments of a large claw, in the drifts of Killiney Bay, Dublin, and its remains in sundry Scotch middens are the only other records of

the common Lobster noted that I am aware of. The Norway Lobster, *Nephrops* common as far south as Dublin Bay, is but doubtful as a fossil. *Galathea squamifera* is almost unique (Reed coll.) from Selsey.

The Entomostracan crustacea have been fully described in the well-known monographs of the Palæontographical Society, but as the remaining orders have met with but little attention, it may be desirable to mention so much as is known, the labours of Mr. Bennie of Edinburgh, and other observers having shewn the possible existence of many species of Isopods, Phyllopods and Cladocera despite the tenuity and softness of the exodermal envelope.

The Cirripedia have in like manner been little studied, whether students have been frightened by Darwin's dictum (Mon. Foss. Bal. Pal. Soc. v. 8), "Let no one attempt to identify the species of this genus from exterior appearances for otherwise he will be sure to make a mistake" is the sum of his warning, I cannot tell, but with all deference I may be allowed to say, that I think the Professor was over cautious in the matter. I have ventured to compile a list of all species, good and bad, described as occurring in these Isles; with such notes as may be desirable up to the present time.

CLADOCERA.

The clays at the Dipple Tile Works, Ayrshire, have yielded the following species:—*Alone elongata*, *A. guttata*, *A. quadrangularis*, *Camptocercus macrourus*, and *Chytoris sphericus*. Mr. Mahoney in his account of the Crofthead or Cowden Glen deposits obtained many fragments of the chitinous debris of a species of *Daphnea*. It also occurs at Garvel Park, on the Clyde.

D. pulex, (Mr. J. Bennie,) is found in the beds at Loch Dronachy, Fife, Corstorphine near Edinburgh, and Burnhead Quarry, Ayrshire.

Of the ISOPODA, the "pill" millipede, *Armadillo vulgaris* Edw. seems to be the only land representative preserved, marine species being unknown. The position of the remains do not suggest any great age, chiefly occurring in the alluvia of rivers, often, as in that of the River Medway, at some distance from the river itself. The brick earth with land shells, interspersed

with marine species (see Rep. York Phil. Soc., 1892, p. 72), at Pegwell Bay, placed upon the summit of the cliffs is the earliest period I know of its occurrence. The depths it occurs at are hardly those to which it would have burrowed if it does this at all. The burrowing habits of *Limnoria terebrans*, Leach, are occasionally preserved in pebbles and pieces of wood, but are seldom noticed'. *Porcellio scaber* has been lately got from an interglacial fissure deposit at Ightham, Kent.

The only PHYLLOPOD recognised as yet, *Apus glacialis*, has been procured in relative abundance, associated with the debris of Arctic plants in an old lake bed at Hailes, near Edinburgh, Corstorphine, and Loch Dronachy, by Mr. James Bennie.

MALACOSTRACA.—BRACHYURA.

Atelecyclus heterodon, Leach, Cor. Crag, Aldborough.

Ebalia Bryerii, Leach, Cor. Crag, Sutton.

„ *Pennantii*, Leach, Passage (or undisturbed) beds at base of the Red Crag, Walton Naze.

Calappa sp., Cor. Crag, Sutton. Interglacial “Mud deposit,” Selsey.

Cancer pagurus, L. Common from the Coralline to the higher Crag, and in most inter and post glacial deposits in England. Garvel Park, Largo and Ardrossan. Shell mound in Scotland. Rare in Ireland. Portrush, Larne.

Garcinus mœnas, L., Coralline to Chillesford Beds, Selsey and Worden, England. Paisley and Oban, Scotland, and Est Clays, L. Larne, Ireland.

Gonoplax angulatus, Edw., Cor. Crag, S. of Aldborough; very rare.

Hyas araneus, Fah., Interglacial clays of Clava, Aberdeenshire. Mr. Scott found a perfect example sitting between the valves of *Pecten islandicus* at Garvel Park, near Greenock.

Inachus dorynchus, Leach, Cor. Crag, Aldborough.

Maia squinado, Herbst., Lower and Middle Red Crag.

Pilumnus hirtellus, Leach, Intergl., Selsey, and L. Larne.

Portunus corrugatus, Penn., St. Erth, Cornwall, Basal passage beds, Walton Naze, Arctic sands, King Edward, Banff. Estuarine clays Magheramorne Lough Larne.

Portunus depurator, Leach, Coralline Crag. Estuarine clays, Belfast.

„ *puber*, L., Cor. Crag, basal beds, Walton Naze, Intergl. Clava, Aberdeen.

„ *pusillus*, Estuarine clays, Lough Larne.

Stenorhynchus tenuirostris, Intergl., Selsey.

ANOMURA.

Eupagurus Bernhardus, L., Coral. Crag, basal beds Red Crag, Walton Naze, Intergl., Selsey, and later Scottish deposits, rare.

MACROURA.

Galathea squamifera, Leach, Intergl., Selsey.

Homarus vulgaris, Edw., Drifts in Ballybrack Bay, Co. Dublin, Middens, Caithness.

CIRRIPEDIA.

Acasta undulata, Darw., Coralline Crag, Suffolk.

Balanus balanoides, preglacial deposits, Chillesford, Wexford. Pleist, Paisley, Dalmuir, Portrush, and elsewhere.

„ *bisulcatus*, Nyst., Lower Coralline to Middle Red Crag

„ *calceolus*, Ellis, Coral Crag.

„ *cariosa*, Darw., Pleist., Bute.

„ *chisletianus*, Sow., Q. J. Geol. Soc. xv., pl. v., 6, 7. Upper St. near Grove Ferry, Chislet, Kent. This is a very doubtful species. The figure is not unlike that of *B. bisulcata*, or *B. spongicula*, to either of which it has some resemblance. Mr. John Brown who discovered this deposit, states in his paper (see above) that it was present with about 35 other organisms. Of the 33 shells, some are undefinable, 10 or 12 are undoubtedly Coralline Crag, a few Red Crag to recent, and two or three land and freshwater, including *Corbicula (Cyrena) fluminialis*, *Hydrobia octona* (*Odos-tomia*, Sp., of J.B. list), and *Valvata piscinalis*, the remainder were undoubtedly lower Eocene, from the Thanet sands to the London clay. As seen some time afterwards by Prof. Prestwich, and later by others, the shells represented an old interglacial lake deposit of postpliocene age, reposing upon the Lower

Eocene sands and clays of the district; the crag fossils I am inclined to think were an accidental inter-mixture, and not from this deposit at all.

Dr. H. Woodward, Catal. Brit. Foss Crustacea, Brit. Mus., 1877, gives it from the Lower Tertiaries, Grove Ferry, as described by Sowerby, Gen. Shells, 1823. Darwin does not mention it in his monograph 1855. Unless further examples are obtained, this species must remain with some suspicion as to its value.

Balanus concavus, Brown, Coralline to Middle Red Crag, and the Arctic deposits of Bridlington and Aberdeenshire. Worden, Lanc.

„ *crenatus*, Brug. This is one of the commonest of the group ranging from the Coralline Crag to recent deposits, especially in Scotland. Portrush.

„ *dolosus*, Darw. Pliocene deposits only, Middle Crag to Weybourne sands.

„ *Hameri*, Asc. Middle and Upper Crag, Weybourne sands, and the Arctic clays of Bridlington, Isle of Man, Loch Gilp, Garvel Park and other Scotch glacial deposits. Kill-o-grange, Ireland. Kelsey Hill. The Scotch and Manx examples have not been certainly identified as this species Forbes calls it *B. uddevallensis*.

„ *inclusus*, Darw. Lower and Middle Crag. The species is rare and little known.

„ *porcatus*, Da Costa. Middle Crag, to Chillesford, Bridlington Selsey, Arctic clays of Fife, to recent deposits, most plentiful in the Western Scotch later beds; raised beach Balbriggan Bay and Portrush. Isle of Man. Kelsey Hill.

„ *Sauntouensis*, Parfitt. This species described as from a raised beach at Sauntou, in Devonshire, is probably only a variety of the common *crenatus*.

„ *spongicula*, Brown, has only been met with in the Coralline Crag.

„ *tintinnabulum*, L. Not uncommon in the different Crag. At Ramsholt, Suffolk, it occurs in clusters with the opercula *in situ*, and is said to have been found at Bute in the glacial clays.

(*Chthamalis*) *stellatus*, Poli., is a form not uncommon in the Craggs or later pleistocenes. It is often intermingled and confused with *B. crenatus*. In this last species, the valves are more regular at the base, in *C. stellatus* they are stellate or rayed.

Darwin Foss. Bal. I., II., f. 2, *d*, figures a Crag specimen with some doubt as to whether it is a young form of *B. bisulcatus* var *plicata*. The form is, however, a very constant one and common.

Coronula barbata, Darw. Middle Red Crag, Sutton and Bawdsey.

„ *diadema*, L. Red Crag, Suffolk, perhaps of Diestien origin.

Verruca stromia, Müll. Craggs and pleistocenes generally, common in Scotch deposits and Portrush.

Pyrgoma anglica, Sow. Coralline Crag, Ramsholt, mid-pleistocene Selsey (Reed Col.), Grove Ferry, Kent (see remarks on *Bal. chisletianus*).

Pollicipes Hearii. The name is given in the Cat. Mus. Practical Geology, London, as a pleistocene species, but without any further details

Scalpellum magnum, Wood, Coralline Crag.

„ *vulgare*, mid-pleistocene, Selsey (Reed Coll.)

The majority of the later Tertiary Echini are still unknown in a living condition: for, omitting as doubtful species two solitary examples, *Agassizia* and *Echinolampas*, and the varieties of *Echinocyamus*, we find that there are 19 or 20 extinct species to 10 recent ones. The starfishes on the other hand are still living mostly in northern seas. It was to be expected that in the course of the numerous deep sea dredgings, this disparity might have been reduced, but contrariwise the investigations of Dr. W. J. Gregory from whom I have been reluctantly constrained to differ in some instances, have tended to increase the original disproportion.

CRINOIDEA.

Antedon (*Comatula*) *Brownii*, E. F., *A. Woodwardi*, E. F. and *A. Ransomii*, all Coralline Crag; the latter also occurs in the basal Craggs at Walton Naze. It is very doubtful if the few Ossicles found justify so many species.

ECHINOIDEA (regular).

Cidaris Belgica, Cotteau. Bryozoan Crag, Aldborough. Identified by comparing some connected plates with Cotteau's figure.

Cidaris pisum (? N. Sp.) A young example of a *Cidaris* from Aldborough, hardly larger than a small pea, the height and breadth nearly equal, tubercles large, may represent another species should larger examples be obtained. The Bryozoan Crag at Aldborough, contains a variety of forms incidental to this habitat that are usually passed over, the small lumps of Crag each requiring individual examination for the smaller *Echinoidea* and *Crustacea*.

Diadema sp. Diestien sands of Lenham, Kent, spines only.

Diadema megastoma, A. Bell. A few examples of an apparently undescribed *Echinoderm*, with the test much rolled and the interior filled with a hard and compact matrix. The conditions of the fossils do not allow an exact diagnosis "Test discord, apex flattened in every instance (apical disc broken away), peristome large, angulated, divided by notches into lobes corresponding with the straight poriferous zones, deeply recessed at the angles, tubercles fairly large, corresponding to the spines above referred to. Height $\frac{1}{2}$ in., diam. $\frac{3}{4}$ in." From the condition of the test, and its localisation in the disturbed portion of the Red Crag, it is probably a deviation from the older Diestien beds. Loc. Middle (Red) Crag, Waldringfield. Mr. S. P. Woodward found a broken spine of *Diadema* in the Cor. Cr.

Temnechinus Woodi, Agaz, of the species described by Forbes. Dr. Gregory groups three under the above name considering the variations to be due to sex or age. In these notes they are treated as distinct to allow for localisation.

T. excavatus, Wood (female of *T. Woodi*, Greg.) Cor. Crag, Sudbourne Park, Ramsholt, and Sutton, Red Crag, Foxhall and Waldringfield.

T. melocactus, E. F. (male of *T. Woodi*, Greg.) Cor. Crag, Ramsholt and Sutton.

T. turbinatus, E. F. (*T. melocactus* immature, Greg.) Cor. Crag, Sutton, Red Crag, Sutton and Waldringfield.

T. globosus, E. F. Cor. Crag, Ramsholt. Prof. Forbes describes without figuring a form of *Temnechinus* combining the shape of *T. excavatus* with the characters of *T. melocactus*. The Ipswich Mus. Coll. contains several fine examples. Should they ultimately prove to be distinct, they might be known as *T. Forbesii*. Cor. Crag, Orford, Ramsholt.

Echinus (*Psammechinus*), *Charlesworthii*, E. F. Lower and Middle Zones of the Cor. Crag, Ramsholt and Sutton.

Echinus (*Psammechinus*), *Henslowi*, E. F. Passage beds at Walton Naze, and Middle Red Crag, Waldringfield. The female according to Dr. Gregory is represented in the Reed Coll., York, by a specimen from Walton (*E. ruber* Keeping, M.S.)

Echinus (*Psammechinus*) *sphæroideus*, Cotteau. This is the *E. Nortoni*, A. Bell, N. Sp., Proc. Geol. Ass. II., 1872, p. 208, Loc., Passage beds, Walton Naze, Loyton.

Echinus *Woodwardi*, Desor. (*E. Lamarcki*), E. F. Abundant in the Coralline Crag, it passes upwards into the Chillesford series at Aldeby, and the Weybourne Crag, Norfolk. The fragments from the Middle Glacial sands of S. V. Wood (II.) of Hopton and Billockby are probably derivative.

Echinus *esculentus*, L. (*E. sphæra*, Müll), Cor. Crag, Sutton, Gedgrave, Orford. Pliocene clay, St. Erth, Cornwall, Chillesford series, Sudbourne church walks; Pleistocenes of W. Scotland, Bute, Loch Gilp, Cumbrae, &c., Magheramorne on Lough Larne, Co. Antrim, and raised sea beds of Largo Bay, Fife.

Echinus *Woodi*, Desor. (*E. Melo.* of E. Forbes, and lists of A. and R. Bell. Proc. Geol. Ass. II.) Cor. Crag, Orford.

Echinus *Lyelli*, E. F. Cor. Crag, Ramsholt.

Echinus *miliaris*, Müll. Cor. Crag, Orford, Red Crag, Foxhall, Nar. Valley, Norfolk, pleistocene Estuarine clays of Belfast and Lough Larne, Caithness.

Echinus paucimiliaris, Greg. This is the specimen referred to as *Toxopneustes Drobachiensis*, Proc. Geol. Ass. II. (now in the Reed Coll.) on the authority of Prof. Agassiz, to whom it was submitted. Upper Red Crag, Butley Mill.

Echinus norvegicus, Sars. Fort William, Irish Estuarine clays, Magheramorne, Lough Larne.

Sphaerechinus brevispinosus, Lam. Mid-pleistocene, Selsey, Sussex.

Strongylocentrotus drobachiensis, Müll. Cor. Crag, Aldborough, early pleistocene, Bridlington, common in the Western Scottish series, raised beach, Portrush. (see *E. paucimiliaris*) Some worn plates of this species were described by Messrs. Crosskey and Robertson as a new species, *E. cumbraensis*, a name afterwards withdrawn. Up. B. Cl. Cheshire.

Strongylocentrotus Cotteaui, A. Bell. A very depressed Echinoid is sometimes met with in the Cor. Crag and is unlike any other with which I have been able to compare it. It follows the tuberculations of *E. Woodwardi* in some degree, but differs essentially in the proportions of height to breadth, the very fine example from Aldborough in the Woodwardian Museum being exceedingly flattened on the upper surface unlike the conical test of *E. Woodwardi*. If the Cambridge specimen here referred to is the one assigned by Dr. Gregory to *S. drobachiensis*, Proc. Geol. Ass. XII., I fear that I cannot concur in the attribution to the latter species, *S. drobachiensis* being essentially a Northern form.

Strongylocentrotus lividus, Lam. Chillesford series, Sudbourne church walks. Pleist. Langbank, N B.

Strongylocentrotus scaber, Greg. Coralline Crag, Aldborough.

IRREGULAR.

Echinocyamus pusillus, Müll. The type form of this polymorphous urchin ranges from the passage or basal beds of the Red Crag at Walton Naze to the Chillesford sands of Aldeby. The only recorded pleistocene localities are the Selsey "mud deposit"

and the raised beaches about Chichester. It is also found in the submarine accumulations of the Turbot bank, Co Antrim. The varieties "*angulosa*, *rotundus*, and *triangularis*, Greg., are Walton forms. *E. hispidulus*, E. F., Cor. Crag and Walton passage beds, and var. *Suffolciensis*, Ag., common to all the Red Craggs are hardly divisible from the typical species. Cotteau on the other hand instituted a new species, *E. Forbesi*, considering Forbes was wrong in his corrections of the Crag species with *E. pusillus*. *E. oviformis*, E. F., Cor. Crag to Chillesford beds, may be a distinct species.

Rhyncopygus (Echinarachnius) Woodi, E. F. This very rare species is only known by a few fragments, from the Coral Crag, Aldborough, the Walton passage beds, and the Red Crag of Sutton. One of Forbes examples may prove to be another species should perfect specimens ever be found.

Echinolampas subrostratus, Greg. The only example of this species in the Brit. Mus. is said to be from the Cor. Crag, Suffolk. In the absence of any definite information as to its locality, I fear that this interesting species has no claim to be considered British, as the matrix to which it is attached is totally unlike any of the English Craggs, indurated or otherwise. It may be a Belgian miocene Tertiary from, the genus being tolerably common in Belgium. See Lyell, Belgian Tertiaries, Q. J. G. Soc.

33645 *Agassizia equipetala*, Greg. This is another species of uncertain origin, the matrix being unlike the usual run of the Crag. Recent and fossil the genus is only known from the West Indies and N. America, and till further evidence is forthcoming as to the genus occurring in England, some doubt must attach to its genuineness as a British fossil. Coralline Crag, Aldborough, (Brit. Mus.)

- *Brissus unicolor*, Leske (*B. Scillæ*, Ag.) Rare in all horizons of the Cor. Crag.

Spatangus purpureus, Müll. Cor. Crag, Sutton, Orford, Aldborough, Walton Naze passage beds, Pliocene clays St. Erth, Middle and Upper Red Crag, Chillesford beds. pleistocene, Selsey, Gourock, and Largo Bay Fifeshire. Dr. Gray made one of the larger *Spatangoids* a new species, *S. regina*. Of this several fine specimens are known fossils, one from the Cor. Crag, Ipswich Museum (no loc.), and another from Sutton, now in the Brit. Mus., are very characteristic examples. This last, I think, comes from that portion of the Coralline Crag Hill, of Prestwich, referred to in "The English Craggs," A. and R. Bell, as a "face of very hard indurated Coralline Crag, highly coloured, and cemented by an infiltration of iron. This contains large *Echini*, *Spatangus* for the most part." The form appears to be a question of size more than specific difference, inhabiting warmer seas than those of the later pliocene period.

Echinocardium (Amphidetus) cordatus, Penn. Cor. Crag, Sutton, Ramsholt, Walton Naze passage beds, Boyton, Middle Red Crag, Sutton, Upper Crag near Aldborough and Sudbourne, Chillesford sands, Aldeby. It also obtains in the early pleistocenes of Bridlington, Kilchattan in Bute, and in the raised estuarine laminarian clays at Magheramorne, Lough Larne.

The Starfishes are seldom well preserved, as in addition to the habit many have of breaking up; the matrix in which they are contained is seldom so favourable for conservation as are the Arctic clays of Montrose containing *Ophiolepis gracilis*.

OPHIUROIDEA.

Ophiocnida brachiata, Mont. Shellag, Isle of Man.

Ophiocoma bellis, Lmk. Dalmuir, Paisley, Greenock, and other W. Scottish pleistocene deposits.

Ophiocoma rosula, Link. pleist, Caithness.

Ophiolepis (Haploaster) gracilis, Allm. Arctic glacial clays, Montrose and Dunbar.

Ophiotrix sp. Brit. Mus. No loc.

Ophiura albida, E. F. Pleist., Garvel Park, Bute, Kilchattan, Duntroon and L. Fyne.

Ophiura texturata, Lam. Pleist., Garvel Park, Greenock.

ASTEROIDEA.

Uraster (*Asterias*) *rubens*, Retz. Cor. Crag and Walton Naze passage beds (Ossicles of ambulacral grooves).

Some granulated fragments of a short rayed starfish with bluntly terminated arms are met with, but only rarely in the Coralline Crag at Sutton amongst the smaller mollusca. They approach very closely to *Solaster* (*Lophaster furcifer*, Dub. et Ker.) and may possibly be an allied species, the species having a wide range on both sides of the Atlantic.

GONIASTERIDÆ.

Ossicles. Walton Naze passage beds.

HOLOTHUROIDEA.

Cucumaria dubiosa, Herdm. Pliocene clays, St. Erth, Cornwall.

Psolus phantopus, L. Pleist. clays, Rothesay, Houston, Greenock, and Garvel Park, N.B.

ALFRED BELL, LONDON.

CATALOGUE OF BRITISH PLANTS IN THE HERBARIUM
OF THE
YORKSHIRE PHILOSOPHICAL SOCIETY.
PART III.

RESEDACEÆ.

	DATE.	COLLECTOR.	HERBARIUM.
149. Reseda alba, Linn. Mignonette. Waste places (<i>alien</i>). <i>Distrib.</i> Southern Europe, &c. <i>Sp.</i> Endgreen, Penzance	(1820)	Rev. J. Dalton	Rev. J. Dalton
150. Reseda lutea, Linn. <i>Waste places</i> on Calcareous soil from Durham to Cornwall. <i>Distrib.</i> Europe, N. Africa & W. Asia. <i>Sp.</i> Summer Castle, Lincolnshire .. In cornfields, &c., about Bramham, Yorkshire	(1810) 1801	Rev. J. Dalton S. Hailstone	Rev. J. Dalton S. Hailstone
151. Reseda Luteola, Linn. Dyer's Weed; Weld. <i>Waste places</i> on Calcareous soil. E. Sutherland southward. <i>Distrib.</i> Europe, N. Africa & W. Asia <i>Sp.</i> Thorp Arch (Yorkshire), and various places upon the Magnesian limestone Near Ripon, Yorkshire	1820 1820	S. Hailstone Rev. J. Dalton	S. Hailstone Rev. J. Dalton

CISTINEÆ.

152. Helianthemum guttatum, Mill. <i>Dry hilly downs</i> , Cork, Jersey, &c. <i>Distrib.</i> Europe, N. Africa, W. Asia. <i>Sp.</i> St. Brelades, Jersey Jersey La Corbiere, Jersey	July 1845 1826 1849	Dr. Dickson Rev. J. Dalton Dr. Dickson	S. Hailstone Rev. J. Dalton S. Hailstone
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153. Helianthemum**Breweri, Planch.***Stony places, Anglesea.*

	DATE.	COLLECTOR.	HERBARIUM.
<i>Sp.</i> Holyhead Mountain, Anglesea ..	June 1, 1850	J. Ball	S. Hailstone

154. Helianthemum marifolium, Mill.*Limestone rocks, Teesdale to N. Wales.**Distrib.* Europe, N. Africa, W. Asia.

<i>Sp.</i> Great Ormes head (Carnarvonshire)	1839	W. Gourlie, junr.	S. Hailstone
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Helianthemum marifolium var. vineale, Pers.

<i>Sp.</i> Cronkley Fell, Teesdale, Yorks.	Aug 25 1824	S. Hailstone	S. Hailstone
„ „ „	1816	Rev. J. Dalton	Rev. J. Dalton
„ „ „	1849	D. Oliver	S. Hailstone
„ „ „	1840	H. Baines	A. W. Walker
Great Isle of Aran, Galway ..	1850	Dr. Melville	S. Hailstone
(Sub nom. <i>H. canum</i> and <i>Cistus marifolius</i>)			
Cronkley Fell, Yorkshire	1883	H. J. Wilkinson	H. J. Wilkinson

155. Helianthemum Chamæcistus, Mill.Rock rose. *Dry places, Sutherland to Cornwall.**Distrib.* Europe (Arctic), N. Africa, W. Asia.

<i>Sp.</i> Black Hambleton, N. Yorkshire,			
Saltburn, N.E. Yorkshire ..	1799	S. Hailstone	S. Hailstone
Bramham, &c., Yorkshire	1800	S. Hailstone	S. Hailstone
Helks Wood, Ingleton, W. Yorks.	1840	H. Baines	A. W. Walker
Roulston Scar, Thirsk, Yorkshire	1890	H. J. Wilkinson	H. J. Wilkinson
Near Newark, Notts.	1816	W. Middleton	W. Middleton
Ripon, Yorks.	1800	Rev. J. Dalton	Rev. J. Dalton

156. Helianthemum polifolium, Mill.

White rock rose. Devon. and Somerset.

Distrib. Mid. and S. Europe, N. Africa

<i>Sp.</i> Rocks near Torquay, Devon. ..	1846	Mr. Garforth	S. Hailstone
Brean Downs, Somerset.	June 1883	H. Fisher	H. J. Wilkinson
Babbicombe, Devon.	1815	Rev. J. Dalton	Rev. J. Dalton
Brean Downs, Somerset.	1820	Woods	Rev. J. Dalton
Brean or Brent Downs, Somerset.	1820	Dr. Bromfield	S. Hailstone

VIOLACEÆ.

	DATE.	COLLECTOR.	HERBARIUM.
157. Viola palustris, Linn.			
Marsh Violet. <i>Swamps and bogs</i> , Sutherland to Cornwall.			
<i>Distrib.</i> Temp. and Arctic Europe, Asia and America.			
<i>Sp.</i> Copgrove, nr. Borobridge, Yorks.	1790	Rev. J. Dalton	Rev. J. Dalton
Near Holwick (Teesdale), Yorks., Ravenroyd Wood (Burnley or Bingley), Fir plantation on the Kirkby Hill road nr. Borobridge	1830	S. Hailstone	S. Hailstone
Hollyhill wood, Castle Howard, Yorks.	1820	W. Middleton	W. Middleton
Halifax, &c., Yorks.	1840	H. Baines	A. W. Walker
Askham Bogs near York			
Langwith	1882	H. J. Wilkinson	H. J. Wilkinson
158. Viola odorata, Linn.			
Sweet violet. <i>Hedgebanks and copses</i> , E. and S. England.			
<i>Distrib.</i> Europe, N. Africa, N. & W. Asia.			
<i>Sp.</i> Copgrove, Borobridge, Yorks. . .	1790	Rev. J. Dalton	Rev. J. Dalton
York	1820	W. Middleton	W. Middleton
Hedges between York and Holgate, Thorparch, Yorks.	1832	S. Hailstone	S. Hailstone
159. Viola hirta, Linn.			
Hairy Violet. <i>Dry chalky soils</i> , Forfar to Cornwall.			
<i>Distrib.</i> Europe and N. W. Asia.			
<i>Sp.</i> Copgrove, Yorks.	1790	Rev. J. Dalton	Rev. J. Dalton
Studley Park, Ripon, Yorks. . .	1800	W. Brunton	S. Hailstone
Rocks at Gordale, Settle, Yorks. . .	1840	S. Hailstone	S. Hailstone
Thorparch, Yorks.	1840	O. A. Moore	O. A. Moore
Hovingham, Yorks.	1820	W. Middleton	W. Middleton
Thorparch, Yorks.	1840	H. Baines	A. W. Walker

160. Viola sylvatica, Fries.

Wood violet. *Hedgebanks and thickets*
from Shetland to Cornwall.

Distrib. Europe, N. and W. Asia.

<i>Sp.</i> Knavesmire, near York	1840	}	H. Baines	A. W. Walker
Halifax, &c., Yorks.	1830			
Askham bogs, York	1883		H. J. Wilkinson	H. J. Wilkinson
Copgrove, Borobridge, Yorks. ..	1790		Rev. J. Dalton	Rev. J. Dalton
(Sub nom. <i>V. canina</i>).				

161. Viola canina, Linn.

Dog Violet. *Sandy and peaty places* from
Caithness to Cornwall.

Distrib. Europe (Arctic), N. & W. Asia,
N. America.

<i>Sp.</i> Strensall Common, York.	1884	H. J. Wilkinson	H. J. Wilkinson
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162. Viola lactea, Sm.

Heaths, York to Cornwall.

Distrib W. Europe.

<i>Sp.</i> Thorn Moor, Yorks.	(1842)	H. Baines	A. W. Walker
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163. Viola stagnina, Kit.

Bogs. E. England and Galway.

<i>Sp.</i> Bottisham Fen, Cambs.	(1830)	Prof. Henslow	Rev. J. Dalton
Newtown, Gort, Co. Galway ..	1894	P. B. O'Kelly	H. J. Wilkinson

164. Viola tricolor, Linn.

Wild Pansy. *Cultivated ground*, Shetland
to Cornwall.

Distrib. Europe (Arctic), N. Africa, N.
and W. Asia.

<i>Sp.</i> Croft, Yorks.	1826	Rev. J. Dalton	Rev. J. Dalton
Thorparch, Yorks.	1830	S. Hailstone	S. Hailstone

	DATE.	COLLECTOR.	HERBARIUM.
165. <i>Viola arvensis</i>, Murr. <i>Sp.</i> Sandy fields, Poppleton, York ..	1882	H. J. Wilkinson	H. J. Wilkinson
166. <i>Viola Curtisii</i>, Forster. <i>Sandy shores</i> from E. Sutherland to Cornwall. <i>Sp.</i> Sandy sea-shore, Lytham and Heysham, Lancashire	1895	H. J. Wilkinson	H. J. Wilkinson
167. <i>Viola lutea</i>, Huds. Yellow (Mountain) Pansy. <i>Hilly districts</i> E. Sutherland to Wales. <i>Distrib.</i> W. and Central Europe. <i>Sp.</i> Kirkby Hill Moor, &c., Yorks. .. Ripon, &c., Yorks. Sawley Moor, Ripon, Yorks. .. Near the water trough in the fields at Boggrington, upon the common as you go from Malham to the octagon summerhouse at the Tarn, and near the Farmhouse. In the field where the Octagon house stands Gordale, &c., Settle, Yorks. .. Teesdale, Halifax, &c., Yorks. .. Pastures by the Tees above High Force, Yorks. and Durham .. Kirby Hill, Borobridge, Yorks. ..	1800 1800 1807 1808 1832 1840 1883 1820	W. Brunton Rev. J. Dalton S. Hailstone S. Hailstone S. Hailstone H. Baines H. J. Wilkinson W. Middleton	Rev. J. Dalton Rev. J. Dalton S. Hailstone S. Hailstone S. Hailstone A. W. Walker H. J. Wilkinson W. Middleton

POLYGALEÆ.

168. <i>Polygala vulgaris</i>, Linn. Milkwort. <i>Heaths and dry hilly pastures</i> , Shetland to Cornwall. <i>Distrib.</i> Europe (Arctic) N. Africa, W. Asia <i>Sp.</i> Croft, Yorks. York Thorparch, Yorks. Fawdington Common, Brafferton, Yorks.	1826 1840 1830 1834	Rev. J. Dalton H. Baines S. Hailstone Rev. W. Gray	Rev. J. Dalton A. W. Walker S. Hailstone H. J. Wilkinson
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	DATE.	COLLECTOR.	HERBARIUM.
169. Polygala oxyptera, Reichb.			
<i>Sandy and chalky soils from Perth southd.</i>			
<i>Sp. From Sands, Southport</i>	1884	F. C. King	H. J. Wilkinson
170. Polygala serpyllacea, Weihe.			
<i>Sp. Thorparch, Yorks. (Sub nom. vulgaris).</i>	1830	S. Hailstone	S. Hailstone
171. Polygala calcarea, F. Schultz.			
<i>Dry soil and rocks, S. & S.E. of England.</i>			
<i>Distrib. Central and S. Europe.</i>			
<i>Sp. Cliff Hill, Lewes</i>	1895	E. H. Farr	H. J. Wilkinson
<i>Chalk hills, Leatherhead downs,</i>			
<i>Surrey</i>	1889	Wm. Whitwell, F.L.S.	H. J. Wilkinson
172. Polygala austriaca, Crantz.			
<i>Sp. Roadside bank, Caterham, Surrey</i>	July 1891	Wm. Whitwell, F.L.S.	H. J. Wilkinson

FRANKENIACEÆ.

173. Frankenia lævis, Linn.			
<i>Sea-Heath. Salt marshes, S. and E.</i>			
<i>coasts of England.</i>			
<i>Distrib. W. Europe, Africa, W. Asia.</i>			
<i>Sp. Shoreham beach, Sussex</i>	Sept. 1895	T. Hilton	H. J. Wilkinson
<i>Yarmouth</i>	(1800)	Rev. J. Dalton	Rev. J. Dalton
<i>„</i>	(1800)	Sir Thos. Gage	Rev. J. Dalton

CARYOPHYLLÆ.

	DATE.	COLLECTOR.	HERBARIUM.
174. Dianthus Armeria, Linn.			
Deptford Pink. <i>Fields and dry banks</i> from Forfar to Cornwall.			
<i>Distrib.</i> Europe, W. Asia, &c.			
<i>Sp.</i> St. Mary's Church, Devon ..	1847	Parker	S. Hailstone
Kingsteignton, Devon	July 10 1837	W. S. Hore	S. Hailstone
Chelsfield, Kent	1843	E. Edwards	Rev. J. Dalton, Jr.
Upnor or (Uppor), Kent	July 17 1826	Prof. Henslow	Rev. J. Dalton
Rochester, Kent	1826	Prof. Henslow	"
Near Wolsingham	(1830)	W. B.	"
Henfield, Sussex	1823	Rev. J. Dalton	"
175. Dianthus deltoides, Linn.			
Maiden Pink. <i>Sandy and gravelly places</i> , Inverness to Kent.			
<i>Distrib.</i> Europe.			
<i>Sp.</i> Scampston Park, Malton, Yorks.	1820	W. Middleton	W. Middleton
Blair Athol, Perthshire	"	"	"
Edinburgh (var <i>glaucus</i>)	"	"	"
Scampston Park, Yorks.	1798	R. Teesdale	Rev. J. Dalton
" " " "	1800	Rev. J. Dalton	Rev. J. Dalton
Terrington (Malton), Yorks. ..	1837	R. Spruce	H. J. Wilkinson
Edinburgh	1830	Giles Munby	G. Munby
Degawny, Conway (Carn.) ..	1884	H. Fisher	H. J. Wilkinson
Terrington, Yorks.	1884	H. J. Wilkinson	H. J. Wilkinson
176. Dianthus cæsius, Sm.			
Cheddar Pink. <i>Limestone rocks</i> , Cheddar.			
<i>Distrib.</i> Belgium southward.			
<i>Sp.</i> Cheddar Cliffs, Somersetshire ..	1820	Rev. J. Dalton	Rev. J. Dalton
" " " "	1830	S. Hailstone	S. Hailstone
" " " "	1840	Stewart	S. Hailstone

	DATE.	COLLECTOR.	HERBARIUM.
177. <i>Dianthus plumarius</i>, Linn.			
Wild pink. <i>Naturalized on old walls.</i>			
<i>Sp.</i> Walls, Fountains Abbey, Ripon, Yorks.	1844	O. A. Moore	O. A. Moore
Thorparch Woods, Yorks. ..	1832	S. Hailstone	S. Hailstone
Studley Woods, nr. Ripon (sub nom. <i>caryophyllus</i>)		Rev. J. Dalton	Rev. J. Dalton
178. <i>Dianthus caryophyllus</i>, Linn.			
Clove Pink.			
Walls, Rochester Castle, Kent	(1800)	Mr. Winch	Rev. J. Dalton
Deal Castle, Kent	1820	W. Middleton	W. Middleton
Rochester Castle, Kent	July 16 1827	Prof. Henslow	Rev. J. Dalton
179. <i>Dianthus prolifer</i>, Linn.			
<i>Sandy & gravelly places</i> , Perth southwards.			
<i>Distrib.</i> Europe, W. Asia.			
<i>Sp.</i> Isle of Wight	1843	Dawson Turner	S. Hailstone
180. <i>Saponaria officinalis</i>.			
Soapwort. <i>Banks of streams, hedges, &c., naturalized.</i>			
<i>Distrib.</i> Europe and temp. Asia.			
<i>Sp.</i> Near Grimbald bridge on the banks of the Nidd (Knaresbro'), Yorks.	1800	Rev. J. Dalton	Rev. J. Dalton
Banks of the Swale, Topcliffe, Yorks.	1790	"	"
" " "	1829	Rev. W. Gray	H. J. Wilkinson
Behind the Castle, Scarbro' ..	1813	S. Hailstone	S. Hailstone
On the rocks in the river above the bridge, Kirkby Lonsdale, West- moreland	Aug. 1834	S. Hailstone	S. Hailstone
Scarbro', Yorks.	1820	W. Middleton	W. Middleton

**181. *Silene Cucubalus*,
Wibel.**

Bladder campion. *Roadsides*, Caithness
to Cornwall.

Distrib. Europe (Arctic), N. Africa,
N.W. India.

Tummel Ferry, Perthshire, Scotland.

Field where the Tower stands, }
Southburn 1830

Copgrove, Yorks. 1790

Thorparch, Yorks. 1840

S. Hailstone

S. Hailstone

„

„

Rev. J. Dalton

Rev. J. Dalton

S. Hailstone

S. Hailstone

182. *Silene maritima*, With.

Sea shores and alpine rills, Shetland to
Cornwall.

Distrib. Shores of Europe (Arctic) to
the Canaries.

Sp. Ilfracombe, N. Devon 1820

Rev. J. Dalton

Rev. J. Dalton

„ „ 1883

H. Fisher

H. J. Wilkinson

Rocks above Wharfe (nr. Settle) .. 1844

J. Tatham

H. J. Wilkinson

From Dawlish on the coast of
Devonshire by my daughter Jane 1847

Miss Hailstone

S. Hailstone

**183. *Silene Armeria*, Linn.
(*Alien.*)**

Sp. Near Yalding, Kent 1844

E. Edwards

Rev. J. Dalton, Jr.

184. *Silene conica*, Linn.

Pastures and sandy heaths, Kent to Forfar.

Distrib. Europe, N. Africa, W. Asia.

Sp. Sandhills nr. Sandown Castle, Kent (1820)

W. Middleton

W. Middleton

Dover (1820)

Rev. J. Dalton

Rev. J. Dalton

Dirleton, Haddingtonshire .. 1830

Giles Munby

G. Munby

Romney Warren, Kent (1820)

Rev. J. Dalton

Rev. J. Dalton

	DATE.	COLLECTOR.	HERBARIUM.
185. <i>Silene anglica</i>, Linn.			
<i>Sandy and gravelly fields, Elgin to Cornwall.</i>			
<i>Distrib.</i> Europe, N. Africa, N. and W. Asia.			
<i>Sp.</i> Field near the road from Wetherby to Bramham (Yorkshire) ..	Aug 7, 1849	Mr. Birbeck.	S. Hailstone
Croft, Yorkshire (<i>S. gallica</i>) ..	1826	Rev. J. Dalton	Rev. J. Dalton
Fields near St. David's, S. Wales	1820	W. Middleton	W. Middleton
186. <i>Silene quinquevulnera</i>, Linn.			
<i>Sp.</i> Duppas Hill, Croydon, Surrey, where I knew it 30 years ago ..	1827	Rev. J. Dalton	Rev. J. Dalton
187. <i>Silene acaulis</i>, Linn.			
Moss campion. <i>Alpine rocks</i> , Shetland to Carnarvon.			
<i>Distrib.</i> All arctic regions, Alps of Europe, N. Asia, and N. America.			
<i>Sp.</i> Ben Lawers, Perthshire	1801	Mr. Winch	Rev. J. Dalton
Rocks, Cwm Idwel, Carnarvon ..	1820	W. Middleton	W. Middleton
Near summit of Snowdon on the Capel Curig side	June 30 1842	J. Backhouse, Jr.	H. J. Wilkinson
Ben Lomond (Stirlingshire) ..	July 25 1839	S. Hailstone	S. Hailstone
Ben Lomond	1848	Mr. McKay	„
Glen Callater, Aberdeenshire ..	Aug. 9 1842	Dr. Balfour	„
Glen Callater	1830	Dr. Greville	Rev. J. Dalton
188. <i>Silene Otites</i>, Wibel.			
<i>Sandy fields and roadsides</i> , Norfolk, Suffolk, &c.			
<i>Distrib.</i> Europe, Siberia, W. Asia.			
<i>Sp.</i> Chippenham gravel pits, Cambridge	1800	Rev. J. Dalton	Rev. J. Dalton
Thetford Heath, Suffolk .. .	1884	Rev. J. D. Gray	H. J. Wilkinson

189. *Silene nutans*, Linn.

Nottingham Catchfly. *Dry places and walls*, Forfar to Channel Islands.

Distrib. Europe (Arctic), Canaries.

	DATE.	COLLECTOR.	HERBARIUM.
<i>Sp.</i> Rocks, Knaresbro', Yorkshire ..	1800	W. Brunton	S. Hailstone
Great Orme's Head, Carnarvon ..	1884	H. Fisher	H. J. Wilkinson
Dover, Kent	1820	W. Middleton	W. Middleton

190. *Silene noctiflora*, Linn.

Sandy fields, Forfar to Cornwall.

Distrib. Europe, Siberia, W. Asia.

<i>Sp.</i> Copgrove, Yorks.	1790	Rev. J. Dalton	Rev. J. Dalton
Near Owlet Hall, Thorparch, Yorks.	1849	Mr. Birkbeck	S. Hailstone
In a field behind the sandhills between Redcar and Marske ..	Aug. 1832	S. Hailstone	„
Oglethorp and Thorparch, Yorks.	„	„	„
Ripon	1820	W. Middleton	W. Middleton
York (Heslington fields)	1840	O. A. Moore	O. A. Moore

**191. *Cucubalus baccifer*,
Linn. (*Alien*).**

<i>Sp.</i> Isle of Dogs, Middlesex	1843	E. Edwards	Rev. J. Dalton, Jr.
Specimen from Mr. Robson (no locality).			

192. *Lychnis alba*, Mill.

White campion. *Fields, hedgerows, &c.*

Distrib. Europe, N. Africa, Siberia.

<i>Sp.</i> Copgrove, Yorkshire	1790	Rev. J. Dalton	Rev. J. Dalton
Brafferton, „	1835	Rev. W. Gray	H. J. Wilkinson
Thorparch, „	1850	S. Hailstone	S. Hailstone

193. *Lychnis dloica*, Linn.

Red campion. *Damp copses, &c.*, Shetlands
to Channel Islands.

Distrib. Europe (Arctic) to the Caucasus.

DATE.	COLLECTOR.	HERBARIUM.
1830	Rev. J. Dalton	Rev. J. Dalton
1844	O. A. Moore	O. A. Moore
1790	Rev. J. Dalton	Rev. J. Dalton

**194. *Lychnis Flos-cuculi*,
Linn.**

Ragged Robin. *Moist Meadows, Copses, &c.*
Shetlands to Cornwall.

Distrib. Europe (Arctic), Siberia.

1790	Rev. J. Dalton	Rev. J. Dalton
1834	Rev. W. Gray	H. J. Wilkinson
1840	S. Hailstone	S. Hailstone

195. *Lychnis Viscaria*, Linn.

Trap rocks, local, N. Wales, M. and S.
Scotland.

Distrib. Europe (excl. Spain and Greece)
to the Caucasus.

1820	Rev. J. Dalton	Rev. J. Dalton
1830	Giles Munby	G. Munby
1840	O. A. Moore	O. A. Moore
(1820)	Dr. Murray	W. Middleton
1830	S. Hailstone	S. Hailstone

196. *Lychnis alpina*, Linn.

Alpine moors and ravines, Cumberland,
Lancashire, and Clova Mountains.

Distrib. Alps, Pyrenees, and Arctic
regions.

1800	Don	Rev. J. Dalton
1810	W. Middleton	W. Middleton
1820	Rev. J. Dalton	Rev. J. Dalton
1830	S. Hailstone	S. Hailstone
1839	Dr. Greville	H. J. Wilkinson
1850	H. Ibbotson	
Aug. 1832	J. McNab	Giles Munby
(1840)		S. Hailstone

197. *Lychnis Githago*, Scop.

Corn-Cockle. *Cornfields*, Orkneys to Channel Islands.

Distrib. Europe, W. Asia to Persia.

Sp. Brafferton, near Borobridge, Yorks. 1829
Ripon 1800

DATE.

COLLECTOR.

HERBARIUM.

Rev. W. Gray

H. J. Wilkinson

W. Brunton

Rev. J. Dalton

198. *Holosteum umbellatum*, Linn.

Old Walls, &c., Norwich and Bury.

Distrib. Europe, N. Africa, W. Asia.

Sp. On old walls, Bury, Suffolk .. 1800
Walls of Norwich, Norfolk .. 1840
Walls, Bury St. Edmund's, Suffolk May 1803
Bury St. Edmund's, Suffolk .. 1855

1800

1840

May 1803

1855

Sir Thos. Gage

S. Hailstone

J. Backhouse

S. Hailstone

Rev. J. Dalton

Rev. J. Dalton

H. Ibbotson

H. J. Wilkinson

199. *Cerastium quaternellum*, Fenzl.

Gravelly pastures, Cheviots to Cornwall

Distrib. W. Europe from Holland to Hungary.

Sp. Farnham, Suffolk (1820)
Kensington, near London (1810)
North side of Castle Hill, Hastings 1834
Ashdown Forest, Sussex June 1895

(1820)

(1810)

1834

June 1895

Rev. J. Dalton

Rev. J. Dalton

W. Middleton

W. Middleton

S. Hailstone

S. Hailstone

E. H. Farr

H. J. Wilkinson

200. *Cerastium tetrandrum*, Curtis.

Sandy and waste places usually near the sea, Shetland to Channel Islands.

Distrib. W. Europe.

Sp. Queensferry (Fife) (1810)
Flamborough Head, Yorkshire,
near the lighthouse 1820
Hastings (Sub nom. *semidecandrum*) 1834
Redcar and Coatham, N.E. Yorks. (1806-30)

(1810)

1820

1834

(1806-30)

Rev. J. Dalton

Rev. J. Dalton

W. Middleton

W. Middleton

S. Hailstone

S. Hailstone

Rev. J. Dalton

Rev. J. Dalton

201. *Cerastium pumilum*, Curtis.

Dry banks, Worcester, Gloucester, Devons.

<i>Sp.</i> St. Vincent's rocks	(1820)	W. Middleton	W. Middleton
(Sub nom. <i>semidecandrum</i>).			
Black rock gully, Bristol, Gloucester	1884	H. Fisher	H. J. Wilkinson

202. *Cerastium* *semidecandrum*, Linn.

Mouse-ear chickweed. *Walls and dry banks*, Shetland to Channel Islands.

Distrib. Europe, N. Africa.

<i>Sp.</i> Ellershaw, near Ripon	1800	W. Brunton	S. Hailstone
Redcar, N.E. Yorks	1799	S. Hailstone	S. Hailstone
„ „	1808	Rev. J. Dalton	Rev. J. Dalton

203 *Cerastium glomeratum* Thuill.

Dry places, Shetland to Cornwall.

Distrib. Europe (Arctic), N. Africa,
W. Asia.

<i>Sp.</i> Brafferton (Borobridge), Yorkshire	1835	Rev. W. Gray	H. J. Wilkinson
Thorparch, Yorkshire	1840	S. Hailstone	S. Hailstone
Stockgill Force, Westmoreland ..	Sept. 1836	S. Hailstone	„

204. *Cerastium triviale*, Link.

Waste places, Shetland to Channel Islands.

Distrib. Europe from the Arctic Circle
southwards.

<i>Sp.</i> Copgrove, Yorkshire	1790	Rev. J. Dalton	Rev. J. Dalton
Stittenham Wood, Flaxton, Yorks.	1843	H. Ibbotson	H. J. Wilkinson
Bottisham, Cambs.	1840	S. Hailstone	S. Hailstone

209. *Stellaria aquatica*, Scop.

Borders of ditches, streams, &c., York southward.

Distrib. Europe, N. Africa, N. & W. Asia

Sp. Claypool Mill, 4 miles from Newark,

Notts. 1816 W. Middleton W. Middleton

Banks of the Foss, York 1840 O. A. Moore O. A. Moore

Near the river Foss, York

Layerthorpe Postern, York 1806

Ditches in the fields between North } 1825

street Postern and Holgate, York

Bramham Beck below the Mill,

Thorparch, Yorks. Aug. 6, 1849

Mr. Birkbeck

„

Ditches about Grandchester Mills,

Cambs. 1839

S. Hailstone

„

Banks of the Foss, Huntingdon 1883

H. J. Wilkinson

H. J. Wilkinson

Banks of the Ouse, Poppleton, York

By the brook past the Angel Inn,

going from Brafferton to York 1834

Rev. W. Gray

H. J. Wilkinson

210. *Stellaria nemorum*, Linn.

Shady places from Dumbarton to S. Wales.

Distrib. Europe excl. Greece & Turkey.

Sp. Weathercoat Cave, Settle, Yorks. 1844

O. A. Moore

O. A. Moore

Castle Howard Woods „ 1790

R. Teesdale

Rev. J. Dalton

Hackfall, Ripon, „ 1800

W. Brunton

„

Studley Woods, Ripon, „ 1800

Rev. J. Dalton

„

Thorparch Woods, „ 1848

S. Hailstone

S. Hailstone

Ravenroyd Wood, Bingley, „ } 1809

S. Hailstone

S. Hailstone

Heath, near Wakefield, „

Howsham Woods, near York . . 1850

H. Ibbotson

H. J. Wilkinson

211. *Stellaria media*, Cyr.

Chickweed. *Waste ground.*

Distrib. All Arctic and N. Temp. regions.

Sp. Copgrove, Yorkshire 1790

Rev. J. Dalton

Rev. J. Dalton

Brafferton, „ 1834

Rev. W. Gray

H. J. Wilkinson

212. *Stellaria Holostea*, Linn.

Stitchwort. *Hedges and copses, &c.,*
Caithness southward.

Distrib. Europe and W. Asia.

	DATE.	COLLECTOR.	HERBARIUM.
<i>Sp.</i> Copgrove, Yorkshire	1791	Rev. J. Dalton	Rev. J. Dalton
Thorparch ,, ...	1840	S. Hailstone	S. Hailstone
York		S. Hailstone	S. Hailstone
Poppleton, near York	1883	H. J. Wilkinson	H. J. Wilkinson
Croft, Yorkshire	1826	Rev. J. Dalton	Rev. J. Dalton

213. *Stellaria palustris*, Ehrh.

Marshy places, Fife to Channel Islands.

Distrib. Europe, W. Asia.

<i>Sp.</i> Copgrove, near Borobridge, Yorks.	1790	Rev. J. Dalton	Rev. J. Dalton
Beverley, E. Yorkshire	1798	Col. Machell	Rev. J. Dalton
In the field called the Brick Garth, adjoining the Canal at Selby (Yorkshire) plentifully	1807	S. Hailstone	S. Hailstone
Askham Bogs (York)	1883	H. J. Wilkinson	H. J. Wilkinson

214. *Stellaria graminea*, Linn

Hedgebanks, &c., Channel Islands to
Shetland.

Distrib. Europe (Arctic), Siberia, W.
Asia.

<i>Sp.</i> Copgrove, Yorkshire	1790	Rev. J. Dalton	Rev. J. Dalton
Thorparch, Yorkshire	1840	S. Hailstone	S. Hailstone
Brafferton, Yorkshire	1830	Rev. W. Gray	H. J. Wilkinson
Upon a Mountain, North of Loch Oich, Invernesshire (under <i>S.</i> <i>scapigera</i>)	(1800)	Rev. J. Dalton	Rev. J. Dalton
Strensall Common, York	1883	H. J. Wilkinson	H. J. Wilkinson

215. *Stellaria uliginosa*, Murr

Wet places, Shetland to Channel Islands.

Distrib. Europe (Arctic), N. Africa,
N. America.

<i>Sp.</i> Copgrove, Yorkshire	1790	Rev. J. Dalton	Rev. J. Dalton
York	1820	S. Hailstone	S. Hailstone
Askham Bogs, York	1883	H. J. Wilkinson	H. J. Wilkinson
Strensall Common, York	1883	,,	,,

216. Arenaria verna, Linn.

Sandwort. *Dry rocks and pastures,*
Cornwall to Shetland.

Distrib. M. and S. Europe, N. Africa,
N. America.

	DATE.	COLLECTOR.	HERBARIUM.
<i>Sp.</i> Rocks above Settle	1840	J. Tatham	S. Hailstone
Near the Strid, Bolton, Yorkshire	1799	S. Hailstone	S. Hailstone
Malham Tarn, Yorkshire	1830	S. Hailstone	S. Hailstone
Ingleborough, W. Yorkshire ..	1893	H. J. Wilkinson	H. J. Wilkinson
Cronkley Fell, Teesdale, Yorkshire	1883	H. J. Wilkinson	H. J. Wilkinson
Llanberries (Carnarvon)	1798	Rev. W. Bingley	Rev. J. Dalton
Snowdon	1800	Rev. J. Dalton	Rev. J. Dalton
Arthur's Seat, Edinburgh ..	(1820)	W. Middleton	W. Middleton
Greenhow Hill		W. Middleton	W. Middleton
Ingleborough, Yorkshire	1787	Rev. J. Dalton	Rev. J. Dalton

217. Arenaria Sulcata,
Schlecht.

Rocks, W. Sutherland and Mid. Perth.

Distrib. Arctic Regions.

<i>Sp.</i> Ben Lawers, Perthshire	1826	Rev. J. Dalton	Rev. J. Dalton
Ben Lawers, ,, ...	1850	H. Ibbotson	H. J. Wilkinson
Ben Lawers, ,, ...	1839	(Gourlie)	S. Hailstone
Craig Chaillack	1837	(Gourlie)	S. Hailstone
(sub nom. <i>A. rubella</i> , Hook).			

218. Arenaria uliginosa,
Schleich.

Banks of a rill, Widdy Bank, Teesdale,
Durham.

Distrib. W. Europe (Arctic), Lapland,
Italy.

<i>Sp.</i> Widdy Bank, Teesdale, Durham ..	1844	J. Backhouse, Jr.	S. Hailstone
Widdy Bank, ,, ...	1844	J. Backhouse, Jr.	H. J. Wilkinson

219. Arenaria tenuifolia,
Linn.

Sandy fields, &c., York, southward.

Distrib. Europe, N. Africa, Siberia,
W. Asia.

	DATE.	COLLECTOR.	HERBARIUM.
<i>Sp.</i> Mildenhall, Suffolk	1800	Rev. J. Dalton	Rev. J. Dalton
Copgrove, Yorks.	1790	"	"
Chichester (Sussex)	1820	"	"
Gog Magog Hills, Cambs. ..	1830	Prof. Henslow	Rev. J. Dalton

220. Arenaria trinervia,
Linn.

Hedgebanks, moist places, &c., Shetland,
Channel Islands.

Distrib. Europe (Arctic), Canaries, and
W. Asia.

<i>Sp.</i> Croft, Yorkshire	1809	Rev. J. Dalton	Rev. J. Dalton
Poppleton, York	1883	H. J. Wilkinson	H. J. Wilkinson
Stittenham Woods, near Flaxton, Yorkshire	1843	H. Ibbotson	H. J. Wilkinson
Copgrove, Yorkshire	1790	Rev. J. Dalton	Rev. J. Dalton
In the Hedgebank in Horton lane above White's House (near Bradford, Yorkshire)	1807	S. Hailstone	S. Hailstone

221. Arenaria serpyllifolia,
Linn.

Wall tops and dry banks, Orkneys, Channel
Islands.

Distrib. Europe (Arctic), N. Africa, and
N. and W. Asia.

<i>Sp.</i> Copgrove, Yorks.	1790	Rev. J. Dalton	Rev. J. Dalton
Poppleton, near York	1820	W. Middleton	W. Middleton
Poppleton, near York	1883	H. J. Wilkinson	H. J. Wilkinson
Thorparch, Yorkshire	1830	S. Hailstone	S. Hailstone
Brafferton, ,, ...	1834	Rev. W. Gray	H. J. Wilkinson

222. Arenaria norvegica,
Gunn.

Shetlands and Orkney.

Distrib. Arctic and Alpine Europe, E.
to Crete.

<i>Sp.</i> Unst, Shetland.	1841	T. Edmondston, jr.	S. Hailstone
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	DATE.	COLLECTOR.	HERBARIUM.
223. <i>Arenaria gothica</i>, Fries			
<i>Habitat.</i> Trackways, hollows and hillocks on the Mountain Limestone between Ribbleshead and Clapham, Yorkshire.			
<i>Sp.</i> Ribbleshead Railway Station ..	Feb 11, 1890	Miss F. P. Thompson	W. Whitwell FLS
Fontgreen; Sulber Nick; Selside ..	1891-95	Lister Rotheray	,,
224. <i>Arenaria peploides</i>, Linn.			
<i>Sandy and pebbly shores</i> , Shetland, Channel Islands.			
<i>Distrib.</i> W. Europe from the Arctic regions.			
<i>Sp.</i> Tunstall, Withernsea, E. Yorks. ..	1883	H. J. Wilkinson	H. J. Wilkinson
Redcar, N.E. Yorkshire	1806	Rev. J. Dalton	Rev. J. Dalton
Blackpool, Lancashire	1801	S. Hailstone	S. Hailstone
Sea-shore, Whitby, Yorkshire ..	1843	H. Ibbotson	H. J. Wilkinson
Coatham, N.E. Yorkshire ..	1799	S. Hailstone	S. Hailstone
225. <i>Arenaria sedoides</i>, Froel.			
<i>Scotch Mountains.</i>			
<i>Distrib.</i> Alps of Central and S. Europe.			
<i>Sp.</i> Ben Lawers, Perthshire	1809	Rev. J. Dalton	Rev. J. Dalton
Ben Lomond, Stirlingshire	1809	Rev. J. Dalton	Rev. J. Dalton
Ben Lawers, Perthshire	1810	W. Middleton	W. Middleton
Ben Lawers, ,, ...	1850	H. Ibbotson	H. J. Wilkinson
226. <i>Sagina apetala</i>, Linn.			
<i>Pearlwort.</i> Dry banks, Forfar and southward.			
<i>Distrib.</i> Europe, N. Africa. W. Asia.			
<i>Sp.</i> Isle of Man	1841	S. Hailstone	S. Hailstone
Copgrove, Yorkshire	1790	Rev. J. Dalton	Rev. J. Dalton
York	1820	W. Middleton	W. Middleton
227. <i>Sagina procumbens</i>, Linn.			
<i>Waste places, &c.</i> , Shetland, Channel Islands.			
<i>Distrib.</i> Europe (Arctic), N. Africa.			
<i>Sp.</i> Ripon and York	1790	Rev. J. Dalton	Rev. J. Dalton
	1820		

228. *Sagina Linnæi*, Presl.*Alps of Perth, Forfar, Sutherland.**Distrib.* Arctic and Alpine Europe.*Sp.* Rocks, East side of Mael, Ghyrddy,

Breadalbane Mts. July 1790

Clova Mountains, Forfar 1830

Aberdeen 1842

DATE.

COLLECTOR.

HERBARIUM.

G. Don

Rev. J. Dalton

Dr. R. K. Greville Rev. J. Dalton

Dr. Balfour S. Hailstone

229. *Sagina subulata*, Presl.*Heaths, dry pastures, Caithness, Channel Islands.**Distrib.* M. and W. Europe.*Sp.* Near London, &c. (1810)

Isle of Mull (1809)

Clova Mountains, Forfar 1846

Isle of Mull (1820)

Rev. J. Dalton

Rev. J. Dalton

W. Middleton

W. Middleton

Dr. Balfour

S. Hailstone

Rev. J. Dalton

Rev. J. Dalton

230. *Sagina nodosa*, Fenzl.*Moist heaths and sandy places, Shetland to Channel Islands.**Distrib.* Europe (Arctic), N. Africa.*Sp.* Malham and Gordale, W. Yorks. 1801

Bramham Moor, on the left, about

a mile from Carr's Inn (Yorks.) 1801

Coppgrove, Yorkshire 1790

York 1820

Sessay Common, York 1834

Redcar, Yorks. 1809

Coatham, ,, ... 1799

Knavesmire, York 1801

S. Hailstone

S. Hailstone

S. Hailstone

S. Hailstone

Rev. J. Dalton

Rev. J. Dalton

W. Middleton

W. Middleton

Rev. W. Gray

H. J. Wilkinson

Rev. J. Dalton

Rev. J. Dalton

S. Hailstone

S. Hailstone

S. Hailstone

S. Hailstone

231. *Spergula arvensis*, Linn*Distrib.* Europe, N. Africa, W. Asia.*Sp.* Coppgrove, Yorkshire 1790Sunderland (sub nom. *S. pentandra*) 1810

Thorparch, Yorkshire 1830

Rev. J. Dalton

Rev. J. Dalton

J. Backhouse

S. Hailstone

S. Hailstone

S. Hailstone

232. *Spergularia rubra*, Pers.

Gravelly and sandy soils, Ross, southward.

Distrib. Europe, N. & S. Africa, N. & W. Asia.

			DATE.	COLLECTOR.	HERBARIUM.
<i>Sp.</i>	Copgrove, Yorkshire	. . .	1790	Rev. J. Dalton	Rev J. Dalton
	Croft, Yorkshire	.. .	1820	„	„
	Cambridge	.. .	1788	„	„
	Horton, Bradford, orkshire	..	1830	S. Hailstone	S. Hailstone
	Strensall, York	.. .	1820	W. Middleton	W. Middleton
	Near Wakefield	.. .	1810	S. Hailstone	S. Hailstone
	Strensall, York	.. .	1883	H. J. Wilkinson	H. J. Wilkinson

233. *Spergularia salina*, Presl.

*Muddy and rocky shores by the sea,
Shetland to Channel Islands.*

Distrib. Europe, N. & W. Asia, N. & S. Africa.

<i>Sp.</i>	Coatham, Yorkshire	.. .	1835	Rev. W. Gray	H. J. Wilkinson
	Scarborough, „	..	1820	W. Middleton	W. Middleton

234. *Buda media*, Dum.

Spergularia Media, Pers.

Distrib. Europe, N. & W. Asia, N. & S. Africa, America and Australia.

<i>Sp.</i>	(Sub nom. <i>Arenaria marina</i> , <i>Arenaria marginata</i> D.C., <i>Lepigonum salinum</i>)	.. .			
	Redcar, Yorkshire	.. .	1806	Rev. J. Dalton	Rev. J. Dalton
	Coatham, „	.. .	1799	S. Hailstone	S. Hailstone
	Esk bank, Whitby, Yorkshire	..	1843	H. Ibbotson	H. J. Wilkinson

	DATE.	COLLECTOR.	HERBARIUM.
235. <i>Spergularia rupestris</i>, Lebel.			
<i>Rocky places near the sea from Ross southward.</i>			
<i>Distrib.</i> France, Spain, Italy, &c.			
<i>Sp.</i> Walls of Peel Castle, I.O.M. . . (sub nom. <i>Arenaria marina</i>).	June 24, 1841	S. Hailstone	S. Hailstone
236. <i>Polycarpon tetraphyllum</i>, Linn.			
<i>Sandy places, Channel Islands, Cornwall, &c.</i>			
<i>Distrib.</i> Europe, Asia, Africa.			
<i>Sp.</i> Guernsey	(1830)	Dr. Bromfield	S. Hailstone
St. Peter's, Guernsey	(1840)	S. Hailstone, Jr.	S. Hailstone

NOTE ON THE JANUARY HIGH BAROMETER.

On January 9th, the barometer over the British Islands rose to a point higher than any previous record for the same region. So early as Sunday morning, the 5th, it had already risen to 30·5 inches in S.E. England and the neighbouring parts of the Continent. It was lowest, 29·7 inches, over Eastern Russia. Next morning pressure had everywhere increased, and from then until the evening of the 11th, British readings were all over 30·5 inches. The centre, however, shifted from the S.E. to the N.W., reaching 31 inches at Stornoway, in the Hebrides, on the evening of the 8th, whilst during Thursday, the 9th, this spread over all Scotland, most of Ireland, the six Northern Counties of England, and the N.W. corner of Wales. Our own official readings were as follows :—

Jan.	8th,	9	A.M.	..	..	..	30·746.
		6	P.M.	..	..	..	·770.
		9	P.M.	..	..	..	·832.
	9th,	8	A.M.	..	..	..	·977.
		9	A.M.	..	..	..	·984.
		3	P.M.	..	..	..	31·020.
		6	P.M.	..	..	..	30·987.
		9	P.M.	..	..	..	·989.
	10th,	8	A.M.	..	..	..	·790.
		9	A.M.	..	..	..	·784.
		6	P.M.	..	..	..	·706.

It will be noted that, at the times when our records are made, the height was less than 31 inches, although the 9 p.m. reading of the 9th is only $\frac{11}{1000}$ short. But the Bootham School recording aneroid shows that, during the afternoon, it had risen higher still, the record at 3 o'clock standing more than 0·03 inch higher than at 9 p.m., so that the barometer actually rose to 31·02 inches. No absolute record of 31·1 inches has been reported from our Islands, but at Fort William, Invernesshire, the reading was 31·098, or only $\frac{1}{500}$ inch short.

The nearest record to this was 31·07 inches in 1820, also on Jan. 9th, and in Scotland. In South England the highest known reading is 30·99 on January 18th, 1882, when the barometer here read 30·89. From 1767 the only other records above 31 inches have been 31·007 on Dec. 26th, 1778, in Banffshire, and 31·046 at the same place on Feb. 24th, 1808. The York records above 30·8, from 1841, are as follows.—

February	1849	..	..	..	30·96
February	1852	..	..	..	30·86
March	1852	..	..	..	30·89
March	1854	..	..	..	30·99
November	1857	..	..	..	30·85
October	1859	..	..	..	30·86
July	1863	..	..	..	30·85
March	1867	..	..	..	30·86
January	1882	..	..	..	30·89
February	1887	..	..	..	30·81
January 9th,	1896	..	..	..	31·02
January 29th,	1896	..	..	..	31·86

It will be noticed that all but one of these are in the winter months.

Since in the 55 years, 1841 to 1895, there are only ten records above 30·8 inches, it is the more curious that we should have had another only three weeks after the high readings of the 9th, the barometer in S. Ireland rising to 30·95 inches. Readings of 31 inches and over are more frequent over Scandinavia, N. Russia and Siberia. Such was the case a year ago, when the great frost was at its severest over the British Isles.

Our lowest reading at York was 27·777 inches on Dec. 8th, 1896, when at Omagh, County Tyrone, the lowest known reading on the globe, 27·24, was recorded. This gives a range of 3·24 inches for York, and 3·86 for the country. If we remember that this is a difference of pressure of nearly 2 lbs. on every square inch, and recall that that means some 3,000 tons per acre, we may appreciate the gigantic forces at work, and yet, so quietly does Nature proceed, that, without instruments, no one could tell whether, at a given time, the barometer was abnormally high or abnormally low.

J. EDMUND CLARK.

THE ABBEY WALLS.

Since the issue of our report a year ago, the arrangement which has been made with the City authorities has been completed. The Corporation has contributed the promised £200 towards the fund, and has taken over from this Council the responsibility for the preservation and maintenance of the whole of the Abbey Wall, in exchange for which the wall has been duly conveyed to the Corporation, as authorized by the Annual Meeting in February 1896. The length of the Abbey wall which has thus been preserved and permanently opened out to view is not large, but it includes one half of the round tower near to Bootham Bar, and a short length of the adjacent wall, as well as the whole of the beautiful angle tower at the corner of Marygate and Bootham, the adjoining house and shop which had partially obscured the tower having been removed.

The removal of this adjoining house and shop was carefully effected by the Corporation, and brought to light some very interesting features of the tower which had been previously hidden by the adjacent tenements. It is fortunate for the right reading of the history thus disclosed that we then had with us the late Curator of the Antiquarian Department, the Rev. Chancellor Raine, whose lamented death a few months later is referred to elsewhere in this report. He was constantly on the spot during the progress of the work, and left on record the annexed valuable memorandum (see page 39) on the history of this angle tower, which will be read with interest,—especially in view of his repeated statement that the historic features brought out by the present restoration have added greatly to the antiquarian interest attaching to the tower.

From this memorandum, it will be seen that the tower dates from 1262-1266, when permission was granted by King Henry III. to surround the Abbey with walls; that in this tower were stored the records not only of St. Mary's, but of most of the other northern abbeys; that during the siege of York in 1644, just before the battle of Marston Moor, the tower was undermined by the Parliamentary army, a part of its wall being blown out, and that when the tower was afterwards rebuilt, a new wall was erected within the line of the older structure,

leaving the projecting fracture of the old wall just as we see it now, excepting that it has been concealed from view by the adjoining house, which has been so recently removed.

The Council would repeat the hope that advantage will be taken in the future of opportunities, as they may occur, to extend the open space along the line of this fine old wall.

The statement of account is printed on page 41.

(On behalf of the Council),

ARTHUR PUREY CUST.

C. A. MILWARD.

RICHARD THOMPSON.

THE PRESERVATION OF THE ABBEY WALLS AT YORK.

OPENING OUT OF MARYGATE TOWER.

The demolition of the old houses which have hitherto hidden the greater part of the tower standing at the junction of Marygate and Bootham is now almost accomplished, and the structure which anciently formed part of the defensive works of St. Mary's Abbey, appears fully exposed to view. The property thus removed was acquired by means of a fund raised under the auspices of the Yorkshire Philosophical Society for the purpose of uncovering the walls when and where opportunity offered. The tower just opened out possesses a special interest, for it formed the centre of one of the most thrilling episodes that occurred during the siege of the city by the Parliamentarians during the Civil War. Its erection dates from the thirteenth century. In consequence of certain conflicts between the retainers of the abbot of St. Mary's and the citizens, relative to their respective jurisdictions and privileges, which occurred in 1262, the abbot solicited the king to allow him to build a wall on each unprotected side of the abbey. The request was granted, and the high walls extending along Bootham and Marygate, great part of which remains, were erected. They were constructed as a complete fortification with battlements, and a wooden gallery within, and towers at certain distances. The works were completed in 1266, and the defences of the abbey at that time have been particularised as follows:— From Bootham Bar to Marygate Tower, 194 yards; from Marygate Tower to the West Tower abutting on

the river Ouse, 420 yards; from the West Tower to the Water House Tower, 246 yards; from the Water House Tower by the rampart of the city to Bootham Bar, 420 yards. The total circumference, it will thus be seen, is 1,280 yards, or nearly three-quarters of a mile. In this outer wall there were only two gateways, one of them opening into Bootham, near the bar, and the other opening into Marygate near St. Olave's Church. The principal tower was the one at the corner of Marygate. In it all the records of the abbey were placed from its foundation. The records of most of the northern abbeys which were deposited at York instead of being sent to London, were also contained in the tower. These consisted of charters, charter books, and various documents, and an official known as the Record Keeper was charged with the care of them. The particular event with which the tower is associated occurred in 1644, during the siege of the city by the Parliamentarians, and shortly before the battle of Marston Moor. On Trinity Sunday in that year, at a time when the besieged were principally at the Minster or in the churches, the Parliamentarians, who had previously laid a mine for the purpose, blew up the tower and effected an entrance within the Abbey walls, obtaining access to the bowling green of the Manor House. A tremendous uproar followed. The Royalists were not prepared for the attack, but many of their officers were in the Manor House at the time and they rushed out of the gates leading from the Manor into the Bowling Green. As they did so the Parliamentarians fired a volley upon them and several were killed. The success of the besiegers was, however, only transitory. The leader of the Parliamentarians at this particular point appears to have harboured some feelings of jealousy towards the commanders of other sections of the besieging army and did not tell them of what he was going to do. Thus when the tower was blown up and his soldiers rushed in, the attack was unsupported. The Royalists were quick to discern this, and sent out a body of men by the Water Gate. These quickly proceeded up Marygate; the Parliamentarians were thus caught in a trap, and such as were not killed had to surrender. It is stated that some hundreds of men were unaccounted for that day in the besieging army, and the Royalist loss was also great, especially amongst the officers. A most regrettable feature of the explosion at the tower was the wholesale destruction of the valuable records which it contained, and which, if preserved, would have vastly enriched the history of the northern part of the country. Many of the fragments were blown to a great distance. It is stated that some of these were

purchased by one of the constables of Burton Constable, and there are a few of the charters of St. Mary's Abbey still preserved in the Minster Library which are singed and discoloured as if by gunpowder. It is not difficult to read upon the tower itself traces of the stirring events of which it was the centre. After the explosion the builders charged with repairing it did not take down the portions left standing, but built the walls of the tower inside the older structure, adapting one to the other, being influenced possibly by the fact that their work would be concealed by the houses in front. Now, after the lapse of well nigh two and a half centuries, the hidden masonry has been exposed to view, and the effects of the explosion are plainly visible in the great wrenches and gaps that occur in the older and outer part of the wall. The portions of the wall still remaining bear upon them the impress of that infinite care and solidity which are the characteristic features of mediæval masonry. By the completion of this work the city may be congratulated upon the addition of another picturesque feature to its attractions, and one which cannot fail to recall some of the most fascinating pages in its history.

(Reprinted from *Yorkshire Herald*, 13th March, 1896.)

STATEMENT OF ACCOUNT.

RECEIPTS.				EXPENDITURE.			
	£	s.	d.		£	s.	d.
Subscription as per list overleaf	670	10	6	Printing ..	10	2	6
Bank Interest to 31st Dec, 1895	2	1	6	Postages ..	12	15	1
Contributed by the York Corporation	200	0	0	Paid for clerical work ..	7	16	1
				Advertisements in <i>Yorks. Herald</i> , <i>Yorks. Gazette</i> , and <i>Yorks. Post</i> 25 ..	2	0	
					55	15	8
				Cost of the two properties as under:—			
				Plot adjoining half round Tower near Bootham Bar. Marygate Angle Tower	800	0	0
				Balance in hand to meet legal expenses not yet paid	16	16	4
					£872	12	0
	£872	12	0		£872	12	0

ABBEY WALLS PRESERVATION FUND.

SUBSCRIPTION LIST.

	£	s.	d.		£	s.	d.
His Grace the Archbishop of York	5	0	0	Brought forward	365	0	0
The Right Hon. the Lord Mayor (Ald. Mackay) ..	10	0	0	Rev. Chas. Johnstone	5	0	0
The Very Rev. The Dean of York	5	0	0	Mr. Thos. E. King	5	0	0
The Sheriff of York (Tempest Anderson, M.D., B.Sc. ...	5	5	0	The Misses Newton	5	0	0
Mr. Henry Cowling	25	0	0	Mr. Richard Pearson	5	0	0
Mr. James Melrose, J.P. ...	25	0	0	Mr. J. S. Pennyman	5	0	0
Major J. Barstow	15	0	0	Mr. & Mrs. Platnauer	5	0	0
The Most Noble the Marquis of Ripon, K.G.	10	10	0	Miss M. Richardson	5	0	0
Mr. J. G. Butcher, M.P. ...	10	10	0	Mr. R. W. Richardson	5	0	0
Sir F. Lockwood, Q.C., M.P.	10	10	0	Mr. John S. Rowntree, J.P.	5	0	0
The Rt. Hon. Lord Masham	10	0	0	Mr. F. Shann	5	0	0
Sir Andrew Fairbairn	10	0	0	Mr. Malcolm Spence	5	0	0
Sir Edward Green, Bart.	10	0	0	Mr. Richard Thompson	5	0	0
Messrs. J. & S. Adams	10	0	0	Mr. W. F. H. Thomson, J.P.	5	0	0
Mr. Bowden Cattley	10	0	0	Mr. William Murray Tuke	5	0	0
Mr. W. Dove, J.P.	10	0	0	Mr. G. W. Umpleby	5	0	0
Mr. F. C. Mills	10	0	0	Mr. J. L. Wharton, M.P. ...	5	0	0
Mr. Joseph Rowntree	10	0	0	Mr. Geo. Whitehead, J.P. ...	5	0	0
Mr. J. F. Taylor	10	0	0	Mr. G. J. Wolstenholme ..	5	0	0
The Misses Wilson (Rock-hurst)	10	0	0	Yorks. Architectural Society	5	0	0
Mr. Basil T. Woodd, J.P.	10	0	0	Mr. Geo. Crawhall, J.P. ...	3	3	0
The Rt. Hon. The Earl of Feversham	5	5	0	Mr. L. Foster	3	3	0
Mr. E. P. Brett	5	5	0	Mr. J. R. Hill, J.P.	3	3	0
Mr. John W. Procter	5	5	0	Mrs. R. S. Lloyd	3	3	0
Mr. Chris. Richardson	5	5	0	Col. Gascoigne	3	0	0
Mr. J. F. Walker, M.A.	5	5	0	Mr. E. Gray	3	0	0
The Rt. Hon. The Earl of Carlisle	5	0	0	Mr. E. Hurst	3	0	0
The Rt. Hon. The Earl of Wharnccliffe	5	0	0	Mr. Alderman Milward ..	3	0	0
The Rt. Rev. the Bishop of Oxford	5	0	0	Rev. Chancellor Raine, D.C.L.	3	0	0
Miss Agar	5	0	0	Mrs. Henry Richardson ..	3	0	0
Mr. John A. Brooke	5	0	0	Mr. R. E. Smithson	3	0	0
Mr. T. Brooke	5	0	0	Mr. Thomas E. Yorke ..	3	0	0
Mr. T. P. Bulmer	5	0	0	Miss Flora Barstow	2	10	0
Hon. H. E. Butler	5	0	0	Miss Barstow	2	10	0
A Citizen of York, per John S. Rowntree	5	0	0	Mrs. Ball	2	2	0
Mr. J. Cleghorn	5	0	0	Miss Belcombe	2	2	0
Mr. W. J. Clutton, J.P. ...	5	0	0	Mrs. Cadman	2	2	0
Mr. H. Copperthwaite	5	0	0	The Rev. Canon Cattley ..	2	2	0
Mr. Francis Darwen, J.P.	5	0	0	Miss F. M. Cattley	2	2	0
Mr. Geo. Dennis	5	0	0	Dr. Collings	2	2	0
Mrs. Robert Fenwick	5	0	0	Mrs. D. J. Daniel	2	2	0
Mr. G. Lane Fox	5	0	0	Mrs. Deighton	2	2	0
Mr. Geo. S. Gibb	5	0	0	Dr. Dunhill	2	2	0
Mr. Frank Green	5	0	0	Mr. C. E. Elmhirst	2	2	0
Mr. W. W. Hargrove, J.P.	5	0	0	A Friend, E.D., per Mr. Milward	2	2	0
Mr. E. G. Harvey	5	0	0	Mrs. Gutch	2	2	0
Mr. W. H. Hudleston	5	0	0	Mr. John Gutch	2	2	0
Mr. Richard Johnson	5	0	0	Miss Harwood	2	2	0
				Col. H. E. S. Hoist	2	2	0
				Miss Joice Hutchinson	2	2	0
				Messrs. Kirby & Nicholson	2	2	0
				Mr. William Lawton	2	2	0
				Capt. Lindberg	2	2	0
				Mr. T. G. Mann	2	2	0
				Mr. Walter Melrose	2	2	0
				Mr. John Pearson	2	2	0
				Miss Peel	2	2	0
£365	0	0		£552	18	0	

CHARTS ILLUSTRATING REPORT ON METEOROLOGY

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